HIGH SCHOOL COMPLETION LONGITUDINAL STUDY
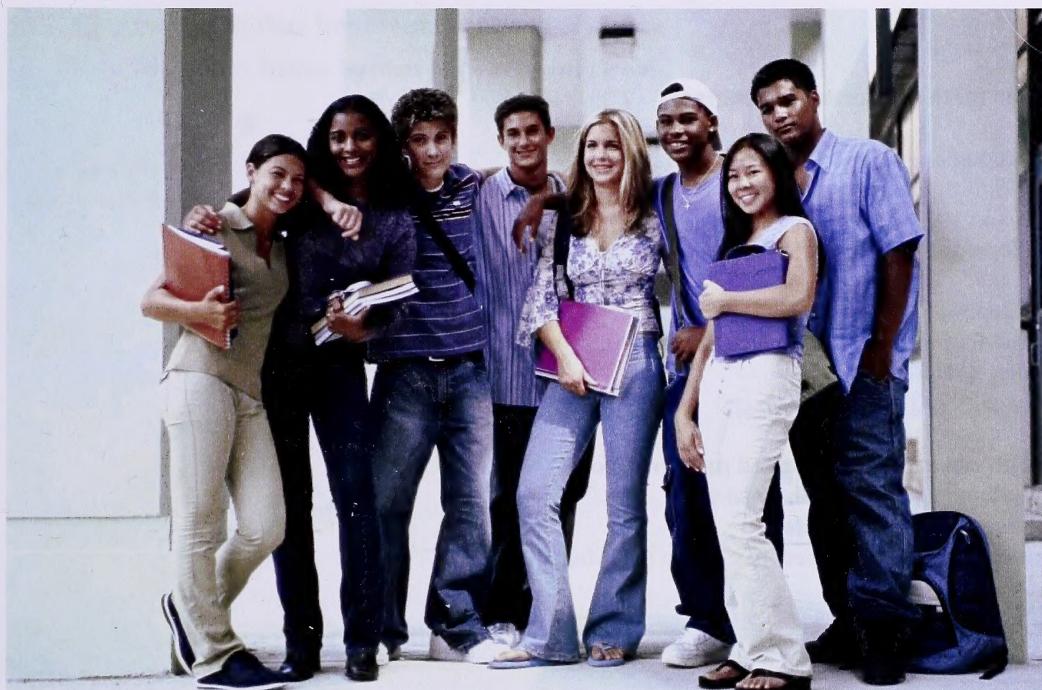
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Education

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This document is intended primarily for:
System and School Administrators
Education Stakeholders
Alberta Education Executive Team and Managers
Teachers
Parents
Community Members

ACKNOWLEDGEMENTS

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EXECUTIVE SUMMARY

While Alberta enjoys proven high, world-class results in student achievement, raising high school completion rates is one of the top priorities in improving the provincial education system. The 2011-12 targeted high school completion rate is 82% five years after entering Grade 10 - a 2.5% increase from the current average rate of 79.5%.

The purpose of this study is to contribute to the Alberta High School Completion Initiative by conducting a concurrent, comprehensive large-scale analysis of presently available provincial data (e.g., Corporate Data Warehouse) and other data sources (e.g., Statistics Canada), in order to better understand the local contexts and factors pertinent to high school completion and inform policies directed at helping students complete high school.

The findings presented in this report are based on the cohort of 32,721 Alberta students who started Grade 3 in 1995-96 and entered Grade 10 in 2002-03.

The major research questions, which this study aims to answer are:
- What features of the Alberta education system and related (geographic and economic) environments are conducive or inhibitive to Alberta students successfully completing high school?
- Do currently available and collected data contribute to research, policy/ program development, and decision making supportive of high school completion?

This report has direct practical utility by offering comprehensive analysis of Alberta longitudinal data related to high school completion, and hence, contemporary contextual information which is imperative for informing local policy and planning decisions. Consequently, the report can be used as a wide-ranging reference source for education practitioners who are looking for evidence-based information to support the policies and strategies targeting high school completion at a school, jurisdiction or provincial level. Examples of such practical usages include scanning and evaluating educational environments, identifying optimal school size, program type, and other potential applications, such as gaining insight into factors associated with high school completion.

This study is directly related to the following Alberta Education 2009-12 Business Plan Goals:
- Goal 1: High quality learning opportunities; and
- Goal 2: Excellence in student learning outcomes.

The report has two major parts. The first portion reports the results of bivariate analysis of the associations between high school completion and each of the identified factors that may contribute to high school completion (potential predictors). Bivariate analysis involves examination of the association between high school completion and each individual predictor variable. The second portion of the report discusses the results of an analysis of the examined predictors by means of multiple logistic regression. Multiple regression modeling accounts for the effects of all included predictors and hence, provides an integrated picture of the key predictors.

The initial bivariate analysis supported the proposition that high school completion is a *prolonged process* rather than a single occurrence or event. For example, the data empirically illustrate the

key importance of early school years (e.g., Grade 3) for student success at the secondary level, as well as challenges associated with being a English as a Second Language (ESL) and/or special needs student, especially during the high school years.

At the same time, multiple regression analysis that examined prospective high school completion predictors altogether demonstrated that high school completion is a remarkably complex and *dynamic* process. This process may entail differentiated priorities and supports depending on the stage of the high school completion process and types of potential completers and their specific needs.

As far as the individual factors affecting high school completion or non-completion are concerned, the following stand alone variables were found to have a notable association (approximately 10 to 30 percent difference) with high school completion as a result of preliminary bivariate analysis:

- Student mobility, defined as a total number of changed school registrations, had a clear negative association with high school completion.
- Academic achievement (provincial achievement tests [PAT] results) at various stages of schooling (i.e., in Grades 3, 6 and 9): better achievement results and lack of test absenteeism were clearly, consistently and positively associated with eventual high school completion rates.
- The frequency (number of times) of ESL coding during junior-high school (grades 7 -9) was negatively linked to eventual high school completion.
- Understandably, the degree of "severity" of special needs coding was directly and negatively associated with high school completion results (e.g., students with one or more severe disability codes completed school at much lower rates than students in one or more mild or moderate special needs categories). At the same time, gifted students notably outperformed their counterparts with no special needs codes.
- The frequency (number of times) of mild/ moderate (and/or other disabilities) special needs coding applied especially at the junior-high level (Grades 7 - 9) was negatively associated with high school completion. Early diagnosis and intervention had a less negative association.
- Type of school program: senior high students reported in exclusively virtual, home and outreach (and other specialized) programs were found to be far behind in high school completion from the students in "regular" school programs, although outreach programs clearly assisted some students to complete.
- Teaching experience: senior high students in schools having 10 or less years of average teaching experience per teacher tended to have lower high school completion rates than their counterparts who were taught by more experienced teachers.
- Socio-economic status (SES) based on 2001census data, such as average family income, average years of mother's education and percent of families in owned dwellings showed positive linkages to high school completion, while percent of lone income families had a negative association with high school completion rates.

In addition, high school completion outcomes were positively, but less notably, associated with the following individually examined variables (less than 10% of observed difference in high school completion rates):

- female gender;

- schools' grade configurations that incorporate elementary and/or junior-high components in addition to high school grades;
- schools located in small urban or rural locales;
- schools' proximity to less economically "booming" (oil development) areas;
- schools' distance from colleges or universities; and
- smaller jurisdiction size.

The multiple regression analysis at the subsequent stages of the study resulted in identifying the following significant predictors for high school completion outcomes (after controlling for the effects of other predictors) three years after entering Grade 10:[1]

Factors increasing likelihood of high school completion
- academic achievement
- gifted coding
- gender – female
- students attending rural high schools or schools in small urban communities under 25,000
- average family income
- average total years of mother's education
- average percent of families in owned dwelling

Factors decreasing likelihood of high school completion
- student mobility – cumulative number of changed school registrations prior to entering Grade 10
- student mobility – district/school change incident(s) after starting Grade 10
- special needs coding
- larger jurisdiction size
- schools proximity to economically expanding (oil) regions
- schools proximity to colleges
- average percent of lone parent families.

The unanticipated finding that the majority of these identified predictors did not contribute to predicting the probability of high school completion for students who continued into the **fourth year** after entering Grade 10, constitutes important new evidence that begs for conducting customized data collection and analysis specifically for addressing high school completion issues. In addition, this finding may be an important starting point for developing evidence-based differentiated approaches for older students who try to complete high school after Grade 12. Further evidence should be generated to uncover the key factors that may enhance high school completion at these later stages. For example, it is reasonable to suggest that the specific type of available supports become more important for the students who continue beyond Grade 12. Therefore, the nature of school programs could be a very powerful predictor of high school completion at this stage, and it is very important to measure the associated effects for this cohort.

The findings outlined in this report have clear practical implications for cross-disciplinary research, focused policy development and interagency interventions at a school, district and system level.

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[1] It should be noted that after combined effects of all included predictors are controlled for in the multiple regression model, the individual associations that were observed as a result of bivariate analysis may change their relative significance or direction.

The report discusses policy implications of the presented findings resulting from both bivariate and multiple logistic regression analyses as well as suggests the following recommendations for future data collection, research and practice to address high school completion issues:

1. Conduct additional data collections and analyses of the high school completion issue at both provincial and local (jurisdiction/school) levels in order to effectively adjust programs to the multiple, dynamic factors affecting high school completion. Specifically:

   - Extend the collection of school level data and its application for decision-making regarding raising high school completion, including student orientation to/engagement with school, effects of various types of programming, etc. (Most of the student progress occurs at a school level).

   - Use Grade Level of Achievement (GLA) data additionally to PATs in future analysis of program quality effects on high school completion.

2. Provide differentiated programming for students who continue after Grade 12 (4th/5th year after entering Grade 10). The specific nature of supports imperative for the late high school completers' success needs to be further researched to identify key program components.

3. Research and verify preliminary findings that indicate lower high school completion rates among outreach and virtual/home-ed students. Consider the experience of some Alberta districts of encouraging student transition from specialized programs back into traditional high schools with appropriate supports.

4. Extend evidence-based examination of high school completion, including necessary data collection, to junior-high students, some of whom drop out before Grade 10. The reasons for early school leaving and the needed supports should be identified and compared to the factors contributing to high school non-completion at the senior-high level.

5. Student disengagement from school should be taken into consideration in the decision-making with regard to increasing high school completion. The Student Orientation to School Questionnaire (SOS Q), undergoing final stages of development, and similar instruments could be used to identify students at risk and to research and develop targeted strategies and interventions.

6. Explore ways of addressing the reasons for and negative effects of student mobility to add to stability in students' lives. For example.:
   - Creating more supportive school environments for highly mobile students (e.g. tutoring) would be conducive of stable relationships for students lacking continuity in their school programs.
   - Providing "wrap-around," one-stop services at schools for students and their families including early/family literacy, tutoring and various student and family counseling, may strengthen family links with both schools and communities.
   - Providing transportation support to students who moved residency, so that they continue attending the same schools is a simple but potentially effective measure to offset the negative effects of student mobility such as disengagement from school and low achievement.

7. Adopt a differentiated approach to the multifaceted phenomenon of student mobility which is driven by diverse circumstances to better understand causation and solutions (e.g., data collection, research, policies and supports).

8. Explore the possibility of more comprehensively tracking students using variables that affect high school completion in order to identify high risk students, alert jurisdictions and support these students in completing school.

9. Engage the post-secondary sector in addressing high school completion issues. The finding that students in communities with a local college tended to complete high school at a relatively lower rate calls for further research into the linkages between basic and post-secondary education. For example, dual-credit policies and enhanced information regarding post-secondary options could help students with post-secondary graduation and career goals.

BACKGROUND AND RATIONALE

A broad array of recent literature unanimously contend that high school completion is a crucial stepping stone for young people to succeed in the contemporary competitive job market where post-secondary education is fast becoming the new educational standard (e.g., Alberta Learning, 2001; Bowlby & McMullen, 2002; Statistics Canada, 2004; Center for American Progress & Institute for America's Future, 2005, etc.). Nonetheless, approximately 20% of young people fail to complete high school in Alberta five years after entering Grade 10.

Alberta enjoys one of the most advanced, world-class education systems. High performance of Alberta students is reflected in recent PISA results (e.g., Statistics Canada, 2008). However, raising high school completion rates remains one of the top priorities in improving the provincial education system. The 2011-12 targeted high school completion rate is 82% five years after entering Grade 10 - a 2.5% increase from the current average rate of 79.5 percent (Alberta Education, 2009).

The purpose of this project is to contribute to the Alberta High School Completion Initiative by conducting a concurrent, comprehensive large-scale analysis of presently available longitudinal provincial data (e.g., Corporate Data Warehouse) and other data sources (e.g., Statistics Canada census data). The goal of the project is to better understand the local contexts and factors that may be pertinent to high school completion and to inform policies directed at helping students complete high school.

The major research questions, which this project aims to answer are:
- **What features of the Alberta education system and related (geographic and economic) environments are conducive or inhibitive to Alberta students successfully completing high school?**
- **Do currently available and collected data contribute to research, policy/ program development, and decision making supportive of high school completion?**

It is important to emphasize, that since Alberta's education system may experience substantial influxes of students from outside the province at different grade levels (e.g., newcomers from other provinces and immigrants), the goal of the project is to separate "external impacts" as much as possible by extracting the data set which would reflect mostly Alberta-based effects.

While the research literature cites the examinations of some of the likely high school completion predictors similar to those presented in this report (including analyses of single variables or different combinations of those), the rationale of using local, Alberta data is as follows:

- First, this Alberta-based study examines very broadly defined, wide-ranging longitudinal data, including a large variety of variables that normally were not concurrently analyzed in other studies or were not analyzed at all. The resultant comprehensive data analysis would make it possible to achieve a fuller, multifaceted examination of the interrelated factors that may impact high school completion. Therefore, this study would contribute to policy and practical efforts focused on increasing high school completion in Alberta and also provide general theoretical and empirical knowledge on high school completion issues.

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- Second, it is very important to base local policies and interventions on the local, contextual research. While studies of a similar nature (e.g., in the USA) could prove to be useful in identifying factors that can be potentially influential for high school completion, it is imperative to know for sure if they fit the local contexts (e.g., if similar results would be obtained using Alberta's data). By the same token, it is not advisable to borrow "externally verified" best practices, policies and strategies and apply them locally without thoroughly investigating local environments and situations pertinent to the Alberta education system.

- Finally, it is useful to consider Alberta Education's existing data collection practices and identify their particular fit for analyzing and monitoring key high school completion issues.

PRACTICAL UTILITY OF THE PROJECT

This report has direct practical utility due to the following reasons. First, as mentioned before, the report is based on *Alberta data*, which is imperative for making local policy and planning decisions. Second, in order to give the multifaceted issue of high school completion as comprehensive evidence-based consideration as possible, the report analytically links the available longitudinal corporate education data with a variety of relevant supplementary data sources. The resultant array of data analyses highlight various circumstances and environments surrounding Alberta students' education paths (e.g., school type and geography, school socio-economic characteristics, etc.) as well as students' own attributes (e.g., mobility traits, special needs history and academic achievement) and link them to high school completion outcomes. Consequently, the report can be used as a wide-ranging reference source for education practitioners who are looking for evidence-based information to support the policies and strategies targeting high school completion at different administrative levels.

This study is directly related to the following Alberta Education 2009-12 Business Plan Goals:
- Goal 1: High quality learning opportunities; and
- Goal 2: Excellence in student learning outcomes.

DATA

In order to accurately appreciate and interpret the results of data analyses, it is important to take into consideration the following particulars of the project data selection and definition:

- Since the project targets *Alberta's* public education system and associated environments, the analyzed data incorporates a cohort of students who spent all or the majority of their school years in public, separate and Francophone schools in Alberta. Therefore, the data were selected for all Alberta students who started Grade 3 in the 1995-96 school year at one of the mentioned type of schools and who entered Grade 10 in 2002-03 also within the Alberta public school system.[2] The schools that might substantially differ from the "mainstream" public schools in terms of high school completion requirements (e.g., Hutterite colony

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[2] The selected student cohort starts at Grade 3 due to unavailability of the earlier data, which were collected using different formats.

schools) were excluded from the data analysis. The resultant project student cohort encompasses 32,721 students in total (or 83% of the total number of Alberta students who started Grade 3 in 1995-96). High school completion data three and four years following entering Grade 10 were collected for the mentioned cohort of students and the relationships between these high school completion results and a broad array of variables that may be associated with high school completion were examined (see the following Results sections).

- Since some of the cohort students could, due to different reasons, interrupt registration with Alberta public school system at certain stages and then return back prior to or at the senior-high level (Grade 10), the data set contains two groups of students - those with "uninterrupted registration," and others with "registration gaps" at various points (about 4% of the total cohort).

- The majority of data analyses exclude senior-high school students reported primarily in virtual or home education programs (not blended), which may considerably differ from regular, "mainstream" schools. If other customized data selections precede some of the data analyses, they are highlighted in the beginning of the corresponding results section.

The variables that could affect high school completion in Alberta (discussed in the Results sections) were chosen based on: (1) available research literature, (2) some local anecdotal untested "grassroots" evidence regarding possible negative effects on high school completion (e.g., Alberta rapid economic development and periodic labor shortages); and (3) on the data availability.

The report adopts the following Alberta Education definitions of student high school completion categories (for additional details refer to Alberta Education, 2006):

(1) *Credentialed Completers* – students who achieve credentialed completion status (Alberta High School Diploma, High School Equivalency Diploma [GED], and Certificate of Achievement for completion of the Integrated Occupational Program);

(2) *Non-credentialed Completers* – students who leave school without one of the above credentials but who have earned credits in high school courses that enable them to continue into post-secondary or apprenticeship programs within three, four or five years of starting Grade 10;

(3) *Continuers* – students, including those registered in upgrading programs, who do not complete high school within three, four or five years but are still involved with the secondary system as evidenced by their having a course completion record;

(4) *Leavers* – students from the Grade 10 Cohort who are not "completers" or "continuers" are considered "leavers" (sometimes referred to as "dropouts").

Data analysis presented in this report combines credentialed and non-credentialed completers unless otherwise specified. In all, non-credentialed completers comprise a very small proportion of students three and four years after entering Grade 10, and do not exceed 3% (see Figure 1).

The term *reported school* refers to the school where the student accrued most of his or her credits within the reporting authority following entering Grade 10. The students in reported schools are referred to as *"reported students."*

METHODOLOGY

Limitations to the Study

This study has two major limitations. First, it could be argued that the study targets high school completion progress of students who "made it" to Grade 10, whereas some students could drop out from school even earlier (e.g., from Grade 8 or 9), and these early dropouts were excluded from the study. However, according to the reviewed literature, "some students leave school before entering ninth grade, but most withdraw during their high school years" (Community Health Systems Resource Group [CHSRG], 2005, p. 59). Early dropouts who did not reach high school merit an independent study. The second limitation to this study is the fact that the available provincial data do not identify specific leaving reasons at the individual student level. Therefore, while the majority of school "leavers" drop out of school, some may leave the province and pursue successful studies elsewhere, a small number could die, etc. Restraining the data set to the students who already entered Grade 10 and tracing their high school completion dynamics following this event somewhat moderates this limitation.

Data Analysis

This report commences with discussing the results of a series of bivariate data analyses (i.e., associations between high school completion and each of the identified potential predictor variables) and culminates with the joint analysis of the cumulative effect of potential predictors on high school completion using binary multiple logistic regression. Bivariate detailed results constitute a useful reference to each of the potential factors that may affect high school completion. The analyses were performed with generalized, categorized data using cross-tabulations.

Simultaneous, multivariate analysis of high school completion data, including most of the mentioned predictor variables, was performed using binary multiple logistic regression to identify the most influential factors that affect high school completion while controlling for the broad array of potential predictors included in the study.

GENERAL OVERVIEW OF THE PROJECT COHORT HIGH SCHOOL COMPLETION OUTCOMES

Figure 1 below shows overall dynamics of high school completion rates for the analyzed cohort of students following three and four years after they started Grade 10. Average completion rates for these students were 73.8% (credentialed and non-credentialed completers taken together) three years after entering Grade 10, and 79.2 % after four years. Not surprisingly, the cohort high school completion outcomes somewhat exceeded total provincial rates for all Alberta students who entered Grade 10 in 2002-03 (70.4 and 76.2 percent respectively). As mentioned above, in order to capture *Alberta-based* factors that can be associated with high school completion, the cohort of students examined in this report are those who started Grade 3 in Alberta and also entered Grade 10 in Alberta. Therefore, the presented data do not account for students outside this cohort.

Figure 1
Dynamics of High School Completion Outcomes in the Project Cohort Students
(Grade 3 in 1995-96 – Grade 10 in 2002-03)

Three Years After Entering Grade 10

Legend:
- Credentialed Completer
- Non-Credentialed Completer
- Continuers
- Leavers

6,2% · 20,0% · 1,2% · 72,6%

Four Years After Entering Grade 10

Legend:
- Credentialed Completer
- Non-Credentialed Completer
- Continuers
- Leavers

14,7% · 6,1% · 2,3% · 76,9%
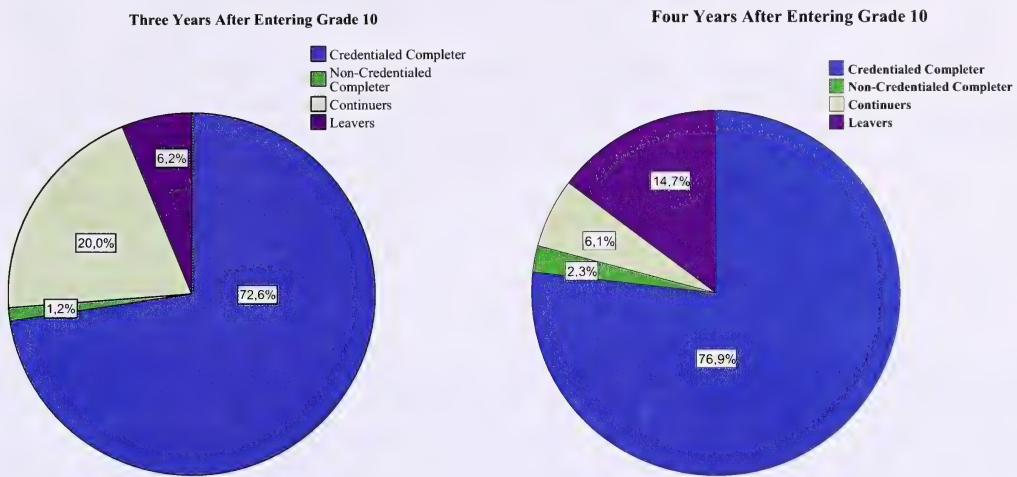
Discussion and Policy Implications: As indicated by the data, the initial wave of high school leavers by the end of Grade 12 (or within three years of entering Grade 10) is quite small (e.g., slightly over 6% in the project cohort), while there is a substantial group of "continuers" (20%), who may end up either on the completing or leaving side. The fact that these students persevered through three high school years and continued their registration into the fourth year, may attest to their aspiration to complete high school. By the end of the fourth year following entering Grade 10 the group of continuers dropped dramatically from 20% to 6%. However, as seen on the right graph above, a large portion of these students (8.5%) end up leaving, whereas only additional 5.4% of continuers joined the ranks of high school completers. At the same time, the pool of leavers grew dramatically from 6.2% to 14.7%. Therefore, it is strategically viable to focus efforts on the pool of *continuers* in the fourth year following entering Grade 10, in order to capture more potential second wave leavers, encourage them to stay in school and consequently increase the proportion of eventual completers. The group of students that continue school after three years of entering Grade 10 may be very diversified in terms of personal circumstances, issues and learning needs. These circumstances and needs have to be carefully examined and an array of alternative, unconventional strategies (including a variety of programming solutions and other supports) need to be developed to help these students achieve high school completion.

It is important to note that some leavers may return back to school and eventually complete high school within the post-secondary system.

The following sections of the report discuss the results of bivariate data analyses.

GENDER-BASED HIGH SCHOOL COMPLETION OUTCOMES

The analyzed cohort of students contained very close numbers of males (16,650) and females (16,071). The results of gender-based bivariate analysis are congruent with previous research findings (e.g., Statistics Canada, 2004) revealing that higher proportions of females tend to finish high school compared to males. Consistently, around 4% more female students were completing high schools compared to their male counterparts (75.8 versus 71.8 percent respectively three years after entering Grade 10 and 81 versus 77.4 percent four years after entering Grade 10).[3] While a similar percentage of males and females left school without completing three years after entering Grade 10 (6.8 and 5.6 percent respectively), by the end of the fourth year there were four percent more male than female leavers (16.7 and 12.6 percent).

Discussion and Policy implications: Earlier research (e.g., Alberta Leaning, 2001; Community Health Systems Resource Group [CHSRG], 2005) came to a conclusion that the risk factors for leaving high school may vary substantially by gender and extend beyond academic reasons. For example, according to the Statistics Canada's Youth in Transition Survey (Statistics Canada, 2004), higher percentages of 17-year-old males who had dropped out cited school-related reasons for their early departure (such as being bored or not interested in school, having problems with school work and with teachers, etc.) as well as wanting or having to work. While mentioning school-related reasons for leaving school as well, females were more likely than males to also cite personal or family reasons (including health matters, pregnancy/child care and problems at home). Therefore, it is clear that at least some gender-sensitive interventions need to account for these (and possibly other) gender variations in reasons for leaving school. CHSRG for example, suggests considering co-op programs for young men that allow them to work and earn money while earning school credits, and school programs for young women that have daycare and counseling services available.

Research indicates that social and emotional factors could considerably impact student performance and sense of connectedness to school (e.g., Collaborative for Academic, Social and Emotional Learning [CASEL], 2003; Croninger and Lee, 2001; Huurre, Aro, Rahkonen & Komulainen, 2006) and presents a strong case for adding assessments of students' affective experience of school to ensure appropriate response to their emotional needs (Alberta Learning, 2001; Stiggins, 2001). The Student Orientation to School Questionnaire (SOS Q) recently developed by Alberta Education in cooperation with the Parkland School Division is designed to address the mentioned assessment needs, including identifying specific gender-based as well as other nuances in students' school affect and associated supports. The SOS Q is designed to measure both elementary and junior/senior high students' affective experience of school and is intended to assist school districts and communities in improving high school completion by grounding school-based decision-making and interventions in comprehensive student assessments (Nadirova, Burger, Clarke & Mykula, 2009). The SOS Q is under final stages of development by Alberta Education and is scheduled to be available in 2009.

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[3] High school completion data presented in this report combines credentialed and non-credentialed completers together, unless otherwise specified. Normally, non-credentialed completers account for a very small proportion of students three and four years after entering Grade 10, and do not exceed 3% (see Figure 1).

THE LINK BETWEEN STUDENT MOBILITY AND HIGH SCHOOL COMPLETION

It has been broadly acknowledged that student mobility can have a sizeable negative impact on students and schools (e.g., Hartman, 2006; Hartman & Franke, 2003; Wasserman, 2000). In order to highlight different facets of the complex link between student mobility and high school completion, different approaches to data analysis were applied and discussed below. The data analyses are based on the full cohort dataset, with the exception of a limited number of secondary students reported in primarily virtual and home education programs. These students were filtered out of the analysis to maintain integrity of the data, since the programming they received may differ substantially from the "mainstream" student population.

Continuity of Alberta School Registration and High School Completion

While the vast majority of cohort students (about 96 percent, or 31,078) were consistently registered with the Alberta public school system prior to entering Grade 10, approximately 4%, or 1,218 of them "interrupted" their registration at different points for one or more years between Grades 3 and 9. The comparison of these two groups revealed striking differences in high school completion outcomes. Three quarters (75.4%) of students with uninterrupted registration completed high school three years after starting Grade 10 (credentialed and non-credentialed completers together) versus less than half of those whose registration was interrupted (46.7%). Over twenty percent (20.9%) of students with interrupted registration left school at that point without completing, compared to only 5.4% of their counterparts with uninterrupted registration. The respective cumulative outcomes were similar for high school completion four years following Grade 10: close to 80.6% of completers and 14% of leavers in the group with uninterrupted registration and 54% of completers and 35% (over a third) of leavers in the group with interrupted registration.

The results have certain limitations and should be considered preliminary, since the compared groups of students were highly uneven number-wise and it was not possible to determine whether some students missed registration due to "normal" reasons, such as parents working outside of Alberta or on unconstructive grounds, such as transience or mobility, failure of parents or guardians to register their children, and so on.

High School Completion by Total Number of Changed School Registrations in Grades 3 - 9

Figures 2 and 3 illustrate high school completion outcomes depending on the total number of school registrations from Grade 3 to Grade 9, including the changes within a single school year (each cohort student had at least one registration count – when he or she entered Grade 3 in 1995-96). There appears to be a clear inverse association between the extent of student mobility and high school completion. Students who experienced the minimal number of moves (one or two) were markedly successful (almost 84% of them completing high school three years past entering Grade 10 and raising to 87% - a year after). At the same time, their peers in the highest mobility category (moved six times or more) did poorly – only 43 and 52 percent of them respectively were able to complete high school three and four years after entering Grade 10.

It should be noted, however, that the vast majority of cohort students moved not more than four times and moving two or three times between Grades 3 and 9 may be considered to be a "normal" occurrence, given that Grades 4, 7 and 9 could be the transitional moves, e.g. from elementary to junior-high school. There were 2,982 most mobile students, who moved five or more times and constituted 11% of the cohort. Although this is a relatively small percentage within the analyzed

cohort, the overall number of students in similar mobility brackets may be much higher province-wide.

Figure 2
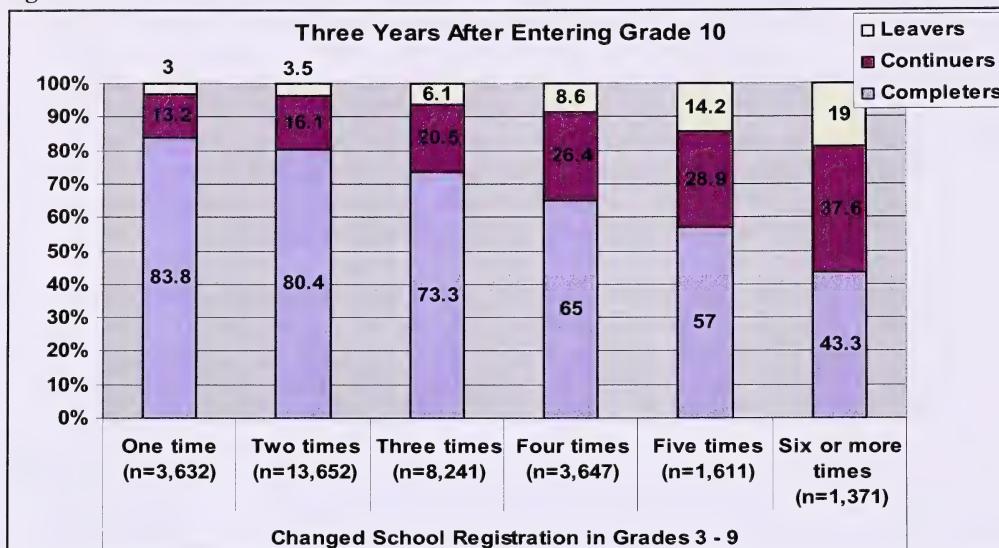
Three Years After Entering Grade 10

Legend: Leavers, Continuers, Completers

Category	Completers	Continuers	Leavers
One time (n=3,632)	83.8	13.2	3
Two times (n=13,652)	80.4	16.1	3.5
Three times (n=8,241)	73.3	20.5	6.1
Four times (n=3,647)	65	26.4	8.6
Five times (n=1,611)	57	28.8	14.2
Six or more times (n=1,371)	43.3	37.6	19

Changed School Registration in Grades 3 - 9

Note: Each total column represents the overall number (100%) of students in a particular mobility category. The sections of the columns are percentages of completers, continuers and leavers within each category.

Figure 3
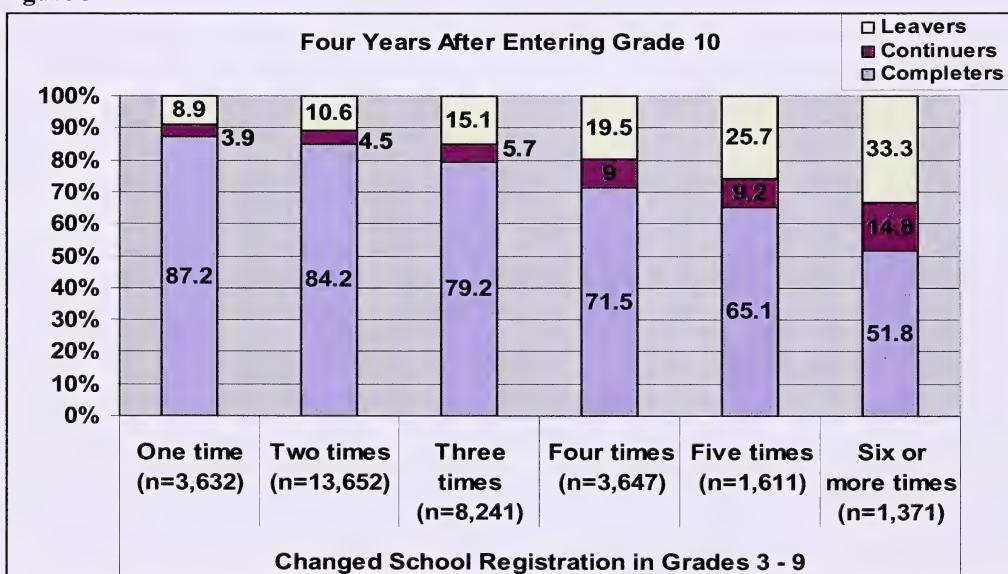
Four Years After Entering Grade 10

Legend: Leavers, Continuers, Completers

Category	Completers	Continuers	Leavers
One time (n=3,632)	87.2	3.9	8.9
Two times (n=13,652)	84.2	4.5	10.6
Three times (n=8,241)	79.2	5.7	15.1
Four times (n=3,647)	71.5	9	19.5
Five times (n=1,611)	65.1	9.2	25.7
Six or more times (n=1,371)	51.8	14.8	33.3

Changed School Registration in Grades 3 - 9

Note: Each total column represents the overall number (100%) of students in a particular mobility category. The sections of the columns are percentages of completers, continuers and leavers within each category.

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Moving Jurisdictions/Schools after Starting Grade 10 and High School Completion

The cohort database also included data on students moving jurisdictions and consequently schools after starting Grade 10 (Figure 4). While the data reveal a sizeable variation in high school completion results in favor of students who did not change schools during senior-high period of their schooling, it is worth noting an ample pool of continuers among the jurisdiction/school "movers" did not complete high school yet remained at school (31.9% after three years and 17.7% after four years following entering Grade 10 among the movers, compared to 18.4 and 4.5 percent for the non-movers). At the same time, the corresponding differences in the proportions of eventual school leavers were not large (approximately two to thee percent). Thus, it is reasonable to suggest that some senior-high students may have moved to schools that offered specialized programs assisting them in high school completion. This hypothesis found additional support when the data considered here received a combined examination in multiple regression analysis (see last section of this report, Table 2). This supports the conclusion that student mobility is a complex, multifaceted phenomenon that precludes a uniform approach to its examination (e.g., just accounting for the moves). Consideration should be given to different forms of and motives for student moves at different stages of schooling and to the variations in potential outcomes.

Figure 4
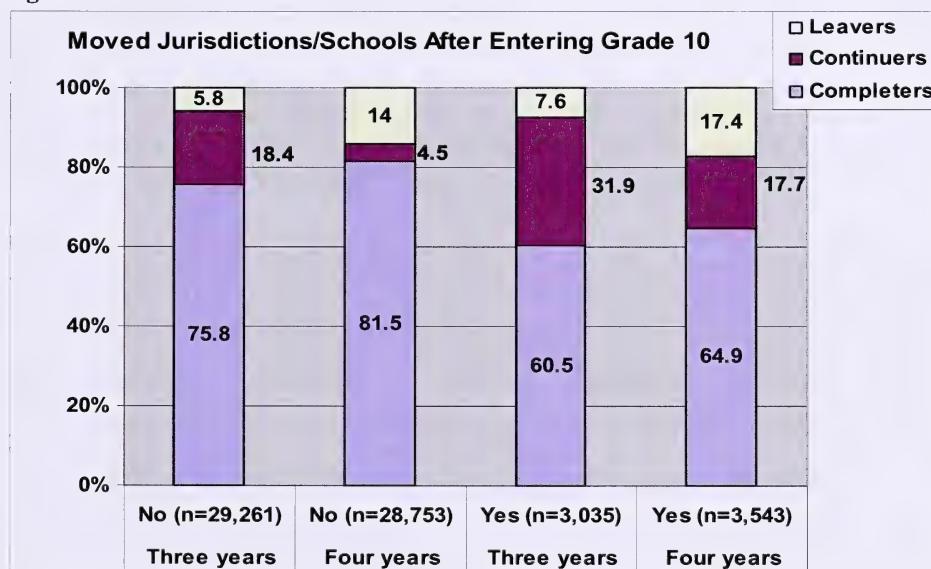
Note: Each total column represents the overall number (100%) of students in a particular category (e.g., moved or not moved jurisdictions/schools). The sections of the columns are percentages of completers, continuers and leavers within each category.

Discussion and Policy Implications: In all, it is clear that student mobility is negatively linked to high school completion outcomes. Although the number of highly mobile students (e.g., five or more changed school registrations in Grades 3 – 9) turned out to be relatively modest for a particular cohort of students selected for this study, it is important to keep in mind that this is only a single student cohort and the total province-wide numbers could constitute many thousands of students. Therefore, it is imperative to "capture" these types of students in relevant programs in order to keep them in school and help them successfully complete high school. The phenomenon of student mobility should be carefully investigated, since it can be associated with a broad array of issues, including family socio-economic status and stability as well as students' own characteristics, such as special needs, orientation to school, and so on. It is obvious that there should be a diversified, multifaceted network of strategies targeting student mobility. Schools can directly affect students through customized interventions including enhancing their learning engagement and social connection to school via individualized instruction sensitive to learning styles and multiple intelligences, monitoring school climate and extracurricular engagements, as well as helping students to learn their career options and appreciate the long-term value of education. Other strategies could require cooperation among educators and other (e.g., social and health) organizations and agencies and may include work with families, educating them about possible negative consequences of student mobility and helping them with housing, education and employment.

The data also demonstrated that the students with "uninterrupted" Alberta registration or, in other words, those who were consistently registered with the provincial public school system prior to entering Grade 10, did much better in terms of high school completion compared to those who might have left the province and then come back or had other reasons for not being registered for one or more grades. Therefore, it could be important to give "re-introduced" students additional attention to insure their better re-adaptation to the new school environments and Alberta's curriculum.

At the same time, the data offered some clues that a uniform or uni-dimensional approach to the mobility phenomenon may not fully grasp the complex nature and effects of this phenomenon. Different forms of student mobility and their potential effects should be given consideration to ensure appropriate policies and interventions, depending on specific stages and circumstances in students' lives and schooling as well as motives for changing schools. For example, while on the one hand switching jurisdictions/schools at the senior-high level – only a few years before graduation, could prove to be detrimental for high school completion, on the other hand the motive behind the move could be seeking pertinent help and programming to ensure high school completion. Hence, it would be advisable to define and measure mobility data in a number of ways to capture and explore different aspects of student mobility and underlying reasons.

STUDENT ACADEMIC ACHIEVEMENT AND HIGH SCHOOL COMPLETION

Figures 5 through 10 below link high school completion outcomes to the results of provincial achievement tests (PATs), which were written (or not taken) by the cohort students when they were in Grades 3, 6 and 9. In order to reduce the scope of analyzed data, the mentioned associations are exemplified by using English Mathematics PAT data. The choice of mathematics achievement data would also provide an additional insight into the province-wide issue with student achievement in mathematics at the junior-high level. Since purely virtual or home education could differ notably in terms of curriculum and delivery methods from "mainstream" schools, secondary students who were reported in these types of programs were removed from the analysis.

Along with the data on students who wrote PAT tests and generated results at three general levels – Below Acceptable, Acceptable and Excellence, this report accounts for students who were registered at Alberta public, separate or Francophone schools in Grades 3, 6 and 9, but did not write PATs due to various reasons. While a test could be missed on valid grounds, skipping PATs might be also indicative of an array of in-school and outside-of-school issues, such as absenteeism, learning and behavioral problems, family issues, etc. Although the report does not aim to control the results for these variables at this point, identifying PAT "non-takers" allows an explorative glimpse at likely high school completion outcomes for this normally obscure group of students.[4]

The data plotted in Figures 5 - 10 provide a clear and consistent indication of the positive academic achievement - high school completion relationship in Grades 3, 6 and 9. For example, students performing at the excellence level tended to complete high school at markedly higher rates than their counterparts who were below acceptable mark (approximately 30– 40 percent difference between these two groups). Students who skipped PAT tests for various reasons were also distinguished by relatively low high school completion.

While the most recent achievement data at the Grade 9 level revealed a clear connection to ultimate high school completion results (Figures 9 and 10), much earlier data for Grade 3 (Figures 5 and 6) offer salient evidence confirming the critical importance of early learning success for much later education results, including high school completion. For example, almost a third of third-graders who achieved below acceptable in 1995-96 did not complete high school in 2005-06 - four years after starting Grade 10 and less then 60% of them completed high school at that point. In contrast, over two-thirds (79%) of their counterparts who passed PATs back in Grade 3 at the acceptable level completed high school four years after entering Grade 10, and only 15% of them left without completing. Grade 3 excellent PAT achievers were the most successful in their following school pathways. Over ninety percent of them completed high school four years after starting Grade 10.

High school completion outcomes for the students who did not write PAT tests varied depending on the reasons for skipping the test. Students who were officially "absent" or "withheld" (presumably mostly for valid reasons) completed school at relatively high rates compared to students who were excused from the exam.

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[4] "Other Reasons" test absentee category, which did not fall into one of the categories shown in Figures 5 through 10, was removed from the analysis due to small numbers of cohort students in this particular category.

Figure 5

Three Years After Entering Grade 10

PAT in Grade 3 Mathematics (English) - 1995-96

Category	Leavers	Continuers	Completers
Below Acceptable (n=1,845)	14.8	38.5	46.7
Acceptable (n=21,216)	5.9	21.3	72.8
Excellence (n=6,101)	3.2	9.0	87.7
Excused (n=374)	21.1	40.9	38.0
Absent/Witheld (n=285)	9.8	24.6	65.7

Note: Each total column represents the overall number (100%) of students in a particular achievement or absence category. The sections within each column are percentages of completers, continuers and leavers.

Figure 6

Four Years After Entering Grade 10

PAT in Grade 3 Mathematics (English) - 1995-96

Category	Leavers	Continuers	Completers
Below Acceptable (n=1,845)	30.4	13.1	56.5
Acceptable (n=21,216)	15.3	6.3	78.5
Excellence (n=6,101)	6.8	2.7	90.6
Excused (n=374)	40.6	13.6	45.7
Absent/Witheld (n=285)	17.9	8.4	73.7

Note: Each total column represents the overall number (100%) of students in a particular achievement or absence category. The sections within each column are percentages of completers, continuers and leavers.

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Figure 7

Three Years After Entering Grade 10

PAT in Grade 6 Mathematics (English) - 1998-99

Note: Each total column represents the overall number (100%) of students in a particular achievement or absence category. The sections within each column are percentages of completers, continuers and leavers.

Figure 8

Four Years After Entering Grade 10

PAT in Grade 6 Mathematics (English) - 1998-99

Note: Each total column represents the overall number (100%) of students in a particular achievement or absence category. The sections within each column are percentages of completers, continuers and leavers.

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Figure 9

Three Years After Entering Grade 10

PAT in Grade 9 Mathematics (English) - 2001-02

Categories: Below Acceptable (n=6,822); Acceptable (n=15,680); Excellence (n=5,343); Excused (n=1,289); Absent (n=995)

Legend: Leavers, Continuers, Completers

Values — Below Acceptable: 9.9, 37.4, 52.6; Acceptable: 3.2, 14.8, 82.0; Excellence: 1.3, 3.4, 95.2; Excused: 21.4, 45.6, 33.0; Absent: 20.1, 37.3, 42.6

Note: Each total column represents the overall number (100%) of students in a particular achievement or absence category. The sections within each column are percentages of completers, continuers and leavers.

Figure 10

Four Years After Entering Grade 10

PAT in Grade 9 Mathematics (English) - 2001-02

Categories: Below Acceptable (n=6,822); Acceptable (n=15,680); Excellence (n=5,343); Excused (n=1,289); Absent (n=995)

Legend: Leavers, Continuers, Completers

Values — Below Acceptable: 27.0, 11.9, 61.1; Acceptable: 9.1, 4.0, 86.9; Excellence: 2.5, 0.7, 96.8; Excused: 42.5, 15.1, 42.4; Absent: 35.2, 13.7, 51.1

Note: Each total column represents the overall number (100%) of students in a particular achievement or absence category. The sections within each column are percentages of completers, continuers and leavers

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Discussion and Policy Implications: The results of analysis of the link between student academic achievement at various grade levels and high school completion have clear policy and program implications.

First, the data confirmed that high school non-completion is rather a *process* than a single occurrence, and this process may start unfolding much earlier than the high school years – as early as Grade 3 according to the available data, or prior. Therefore, the development of strategies to ensure early learning success for all students is critical for raising high school completion, including the means of maintaining continuous student academic and social engagement with school.

Second, student achievement data, including periodical provincial tests (PAT) and supplementary continuously gathered grade level of achievement (GLA) data, can be used by schools and jurisdictions as an important diagnostic tool to identify different groups of potential high school leavers and develop customized interventions for these groups. For example, close attention should be given to the students who take PATs, but achieve below standard. The fact that these students attempt PATs and a portion of them "make it" to Grade 10, attests to their perseverance and willingness to stay in school. Therefore, the methods should be identified and applied that enable students to achieve at the acceptable level or higher and finish high school after entering Grade10.

The students who are absent or excused from PATs also deserve close examination for the underlying reasons for missing the tests. The reasons for not taking an achievement test at all may differ from the factors leading to below acceptable results on the test. While being a relatively small pool of cohort students, the absent or excused group accounted for the highest dropout rates.

HIGH SCHOOL COMPLETION BY ENGLISH AS A SECOND LANGUAGE (ESL) CODING

Students with various ESL codes between Grades 3 and 9 (prior to entering Grade 10) accounted for a small proportion of the project cohort - 1,099 or 3.4%.   Specific ESL codes included: (1) Canadian-born ESL Funded; (2) ESL Non-funded; and (3) ESL Funded foreign-born. Given a small total number of ESL students, all mentioned categories were considered in this study jointly, under a single ESL label.

The following data selections were made before proceeding with the analysis of high school completion by ESL status. The ESL variable was initially measured as a cumulative count of all ESL codes received by students from Grade 3 through 9. Thus, in order to capture correctly the ESL codes received by each student, only students with uninterrupted Alberta registration were selected for the analysis (i.e., those who were consistently registered with a public, separate or Francophone school in Grades 3 - 9). Since the proportion of ESL students in the total cohort was small, only two categories: (1) non-ESL and (2) one or more time ESL-coded during Grades 3 – 9 were compared (Figures 11 and 12). Additionally, students whose high school completion results were reported in virtual or home education programs were removed from the analysis.

In order to better illustrate the link of ESL status to high school completion, the data analysis was run in two stages.
- The first round of data analysis accounted for students who were coded as ESL in *only* their elementary school years (Grades 3 through 6).

- The second stage of data analysis involved students who also received any of the ESL codes in junior-high school, prior to entering Grade 10 (Grades 7 through 9).

High School Completion Outcomes for Students Coded as ESL in Elementary Grades Only

No conspicuous differences were observed in eventual high completion outcomes between the cohort students with no ESL coding and students who were coded as ESL in their elementary grades (Grades 3 - 6), but did not receive ESL coding during subsequent, junior-high years (Figure 11). By the fourth year following entering Grade 10, ESL students even somewhat "outperformed" their non-ESL counterparts, accounting for 3% more of high school completers and 3% less of leavers. It should be kept in mind, however, that these data comparisons should be interpreted with caution, given a small proportion of ESL students in the analyzed data set.

Figure 11
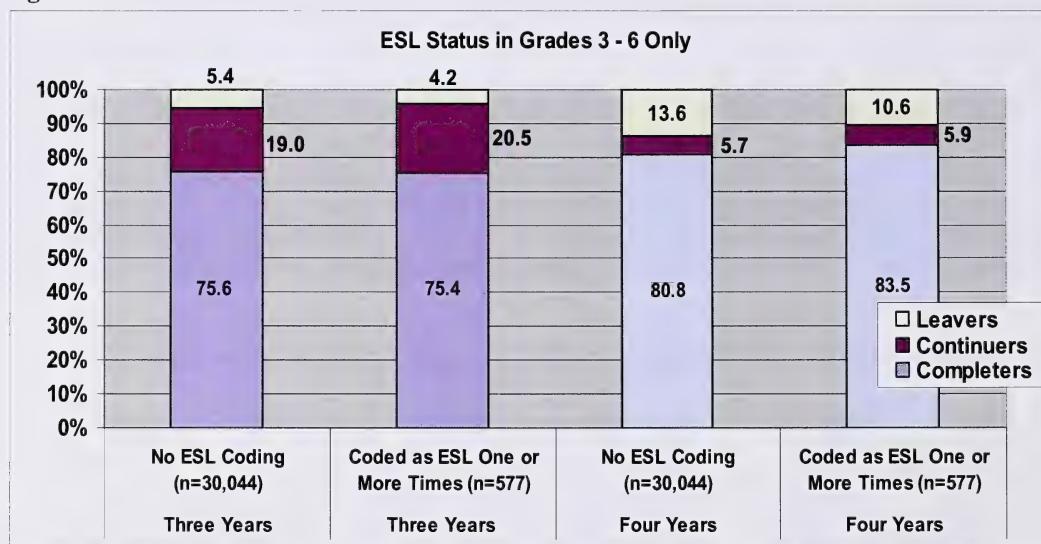
Note: Each total column represents the overall number (100%) of students without or with ESL coding. The sections within each column are percentages of completers, continuers and leavers.

High School Completion Outcomes for Students Coded as ESL in Junior-high Grades

Unlike students who had ESL codes only in upper-elementary grades, students who were also coded during their later, junior-high years showed notable variations in high school completion (Figure 12). Consistently, both after three and four years following entering Grade 10, cohort students with no ESL coding revealed substantially higher completion rates compared to students who were coded ESL in Grades 7-9. Furthermore, the latter had higher proportions of leavers than the non-ESL students.

Figure 12
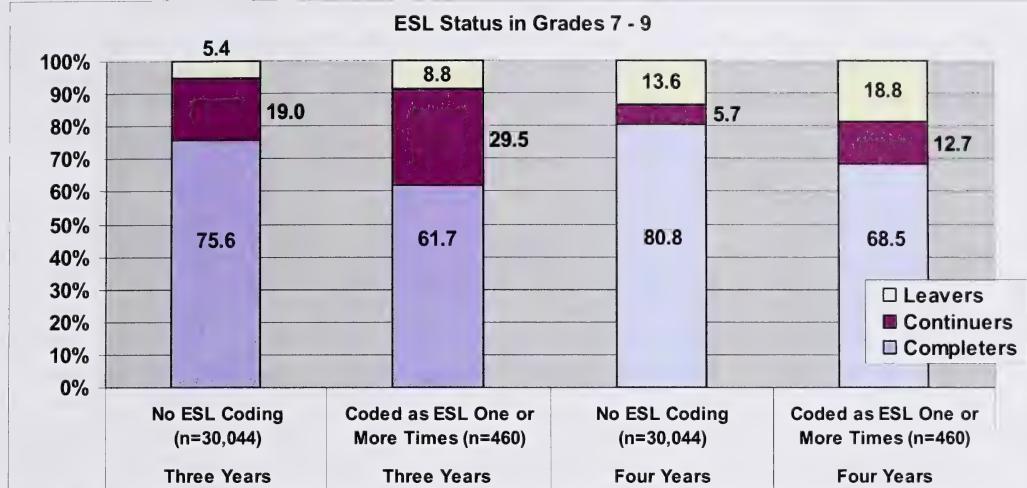
Note: Each total column represents the overall number (100%) of students without or with ESL coding. The sections within each column are percentages of completers, continuers and leavers.

Discussion and Policy Implications: Although a caution needs to be exercised in making conclusive inferences from the ESL data analysis due to very small number of ESL-coded students in the project cohort, the available data demonstrated that high school completion outcomes did vary notably if the students received ESL coding at the junior-high level. However, it was also shown that ESL status during early (elementary) school years might have the least effect on eventual high school completion, providing it is not "extended" further to junior-high school. Therefore, an effort should be put into diagnosing and eliminating language barriers and differences during elementary years, so that students who were ESL-coded early may have sufficient room to "even out" with their non-ESL counterparts before entering high school.

It is important to keep in mind that this study focuses on the cohort of secondary students who were also registered in Alberta public school system as early as Grade 3. Even though the majority of these students were continuously registered with Alberta schools prior to entering Grade 10, the ESL link to high school completion was quite pronounced. It should be noted however, that the Alberta school system experiences continuous influx of fresh immigrant students at various grades and variations in high school completion might be much more drastic if this particular group were added to the equation.

The issues pertinent to early-identified ESL students versus students who entered the system later and have not much time left to catch up on language as well as make cultural adjustments prior to entering high school, might differ substantially. Therefore, customized, differentiated strategies and interventions for specific needs, circumstances and age groups are essential in order to effectively eliminate different types of language and cultural barriers.

HIGH SCHOOL COMPLETION BY SPECIAL NEEDS CODING

There are sixteen exception codes used for identifying students with special needs within the Alberta education system. Due to relatively modest numbers of students with special needs in the total project cohort and because of the difficulties in interpreting the detailed data, these original codes were grouped in three generalized categories, as shown in Table 1, including: (1) Severe Special Needs; (2) Mild/ Moderate Special Needs (and other disabilities); and (3) Gifted.

In total, 343 students (1% of the total cohort) were coded at least once as "severe special needs" in Grades 3 through 9 (prior to entering Grade 10) and another 466 students (1.4%) were coded in both "severe" and "mild/ moderate" categories. The majority of students with special needs - 5,248 or 16% - fell into the "mild and moderate" category and 1,719 students (5%) were coded as "gifted." The remaining 94 students (0.3%) received various combinations of the mentioned codes and were excluded from the analysis because they did not fit into any of the above-mentioned categories.

Similarly to the ESL data, special needs variables were measured as total counts of codes received by each individual student throughout his or her elementary and junior-high years (Grades 3 - 9), prior to entering Grade 10. Thus, to account for all codes assigned, only cohort students with uninterrupted Alberta registration were selected for the analysis. Furthermore, the data on students whose high school completion results were reported in virtual or home education programs (which differ from the "mainstream," regular school settings) were excluded from the analysis.

Table 1. Exception Codes Groupings for the Data Analysis Purposes

Codes	Exception Codes' Description	Generalized Categories for the Data Analysis
41	Severe Cognitive Disability	
42	Severe Emotional/Behavioral Disability	**Severe Special Needs**
43	Severe Multiple Disability	
44	Severe Physical or Medical Disability	
45	Deafness	
46	Blindness	
51	Mild Cognitive Disability	
52	Moderate Cognitive Disability	
53	Emotional/Behavioral Disability	
54	Learning Disability	**Mild/ Moderate Special Needs and Other Disabilities**
55	Hearing Disability	
56	Visual Disability	
57	Communication Disability	
58	Physical/Medical Disability	
59	Multiple Disability	
80	Gifted	**Gifted**

High School Completion Outcomes for Different Categories of Special Needs Students

Figures 13 and 14 illustrate the link to high school completion outcomes three and four years following entering Grade 10 for the mentioned special needs categories and their combinations. Unsurprisingly, high school completion rates were very low for a small group of students coded with severe special needs, even though these students were enrolled in Grade 10. Thirty-two and 44

percent of them completed high school three and four years after entering Grade 10. However, the outcomes were even lower for the students with a mixture of severe and mild/moderate disability codes. A third of them completed high school four years after entering Grade 10 and over half left without completing.

Figure 13
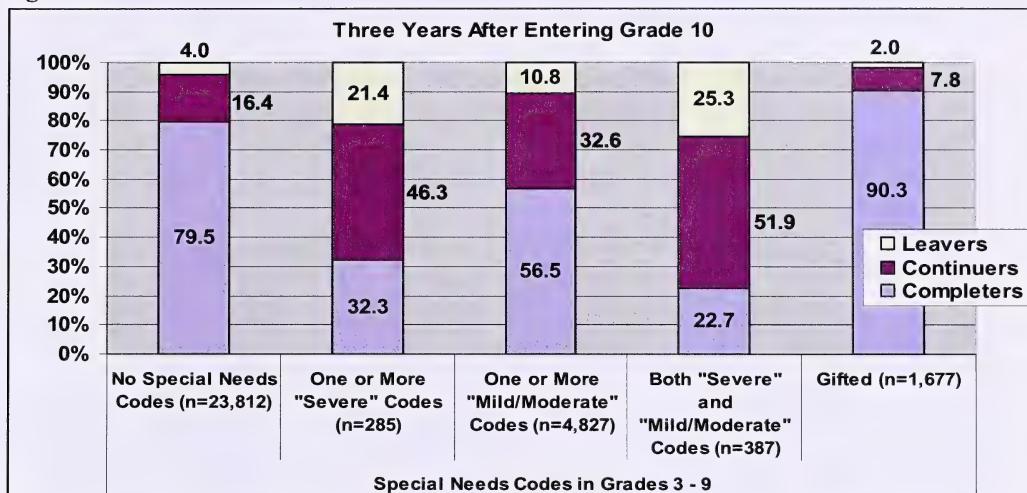
Three Years After Entering Grade 10

Category	Completers	Continuers	Leavers
No Special Needs Codes (n=23,812)	79.5	16.4	4.0
One or More "Severe" Codes (n=285)	32.3	46.3	21.4
One or More "Mild/Moderate" Codes (n=4,827)	56.5	32.6	10.8
Both "Severe" and "Mild/Moderate" Codes (n=387)	22.7	51.9	25.3
Gifted (n=1,677)	90.3	7.8	2.0

Special Needs Codes in Grades 3 - 9

Note: Each total column represents the overall number (100%) of students without or with special needs coding. The sections within each column are percentages of completers, continuers and leavers.

Figure 14

Four Years After Entering Grade 10

Category	Completers	Continuers	Leavers
No Special Needs Codes (n=23,812)	84.4	4.7	10.9
One or More "Severe" Codes (n=285)	44.2	14.4	41.4
One or More "Mild/Moderate" Codes (n=4,827)	63.9	10.5	25.5
Both "Severe" and "Mild/Moderate" Codes (n=387)	34.1	15.0	50.9
Gifted (n=1,677)	92.3	3.1	4.6

Special Needs Codes in Grades 3 - 9
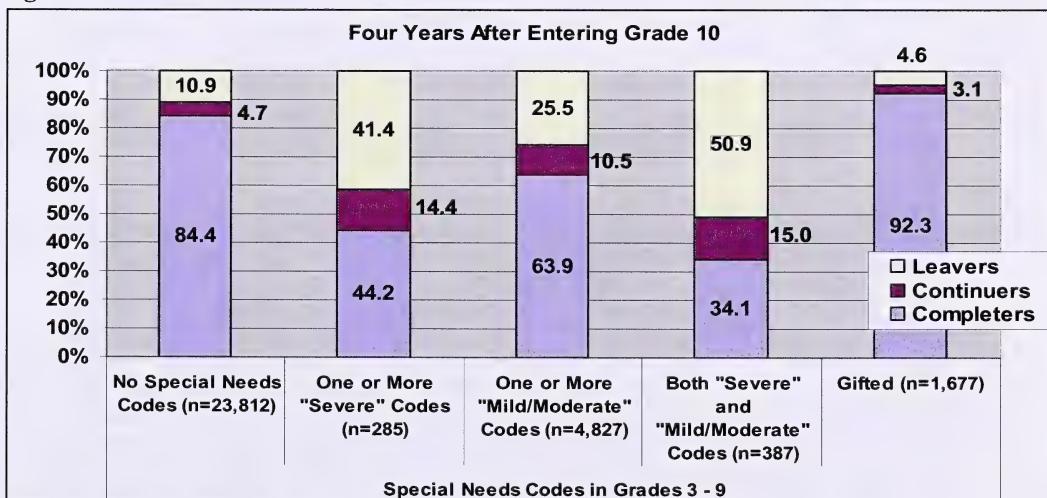
Note: Each total column represents the overall number (100%) of students without or with special needs coding. The sections within each column are percentages of completers, continuers and leavers.

On the other hand, students who were never coded as special needs in Grades 3 - 9 revealed much better (eighty percent or higher) high school completion rates. Furthermore, as expected, gifted

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cohort students outperformed their counterparts in all other categories, exceeding 90% completion rate as early as three years after starting Grade 10.

The results of analyses presented in Figures 15 through 17 below focus on the largest, mild/ moderate (and other disabilities) special needs category of students. Their high school completion rates were lower than those of the students with no special needs, but much higher than the rates of their severe special needs counterparts.

In order to examine the link between special needs and high school completion at different stages of schooling, the data analyses were run on the following mutually exclusive groups of mild/ moderate special needs students:
- students who were assigned special needs codes in Grades 3 - 6 only (in elementary school);
- students who were coded as special needs in Grades 7 - 9 only (in junior-high school); and
- students who had special needs codes assigned throughout Grades 3 - 9.

High School Completion Outcomes for Cohort Students Who Were Coded as Mild/ Moderate Special Needs in Elementary School Only (Grades 3 – 6)

High school completion data presented in Figure 15 clearly differentiate between the students who were not coded with special needs in Grades 3 - 9 and students who received various mild or moderate special needs coding, but only at the elementary level. Although these latter students were not identified as special needs at the junior-high level, their eventual high school completion rates were notably (at least 10%) lower than those of the non-special-needs students. Still, the elementary-level only mild/moderate special needs students ultimately reached the 74% high school completion mark four years after entering Grade 10. However, at this stage the proportion of continuers in this particular group was relatively small, while the proportion of leavers was 18%, appreciably exceeding 11% dropout rate among the non-special-needs students.

Figure 15
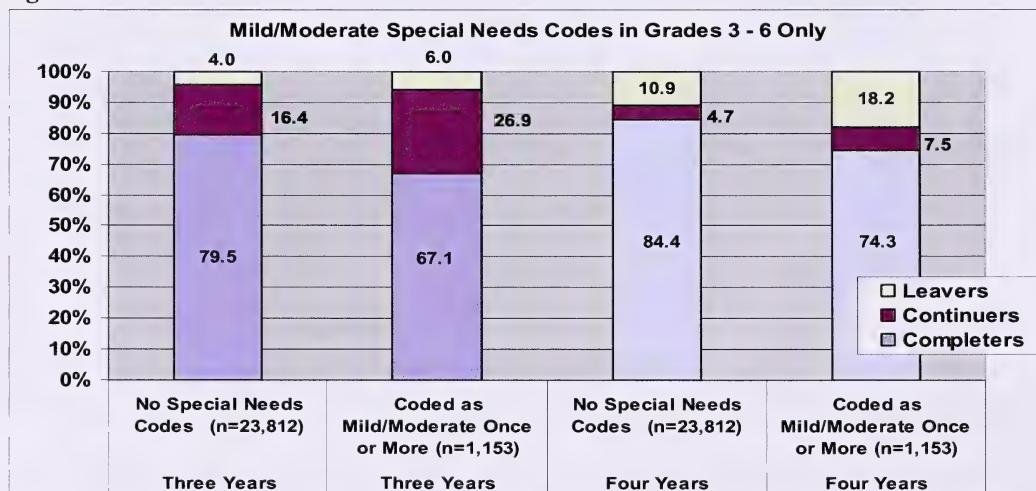
Note: Each total column represents the overall number (100%) of students without special needs coding or with mild/moderate coding. The sections within each column are percentages of completers, continuers and leavers.

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High School Completion Outcomes for Cohort Students Who Were Coded as Mild/Moderate Special Needs in Junior-high School Only (Grades 7 – 9)

The high school completion rates of students who received mild/moderate special needs coding during junior high school were conspicuously lower compared to their non-special-needs counterparts (Figure 16). High school completion rates for students with special needs in Grades 7 – 9 approached 60% four years after they entered Grade 10, while students with no special needs completed school at 84% rate. Over a quarter of special needs students left school by that time compared to 11% of students with no special needs.

Figure 16
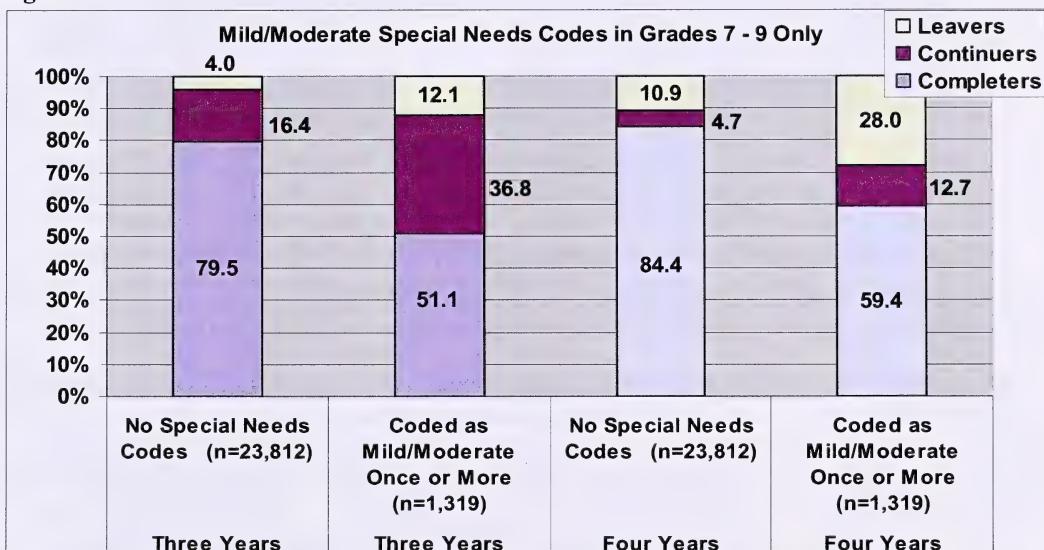
Note: Each total column represents the overall number (100%) of students without special needs coding or with mild/moderate coding. The sections within each column are percentages of completers, continuers and leavers.

High School Completion Outcomes for Cohort Students Who Were Coded as Mild/ Moderate Special Needs Both in Elementary and Junior-high School (Grades 3 – 9)

Students who were coded as mild/ moderate special needs throughout both elementary and junior high grades ended up with low high school completion rates compared to their non-special-needs counterparts (Figure 17). The differences in high school completion three and four years after entering Grade 10 hovered around 20 and 25 percent. Over a quarter of these special needs students did not complete high school four years following starting Grade 10.

The data indicated that the "intensity" or frequency of special needs coding in this group of students may have some negative association with eventual high school completion. Students who were coded six or more times in Grades 3 – 9 completed high school at slightly lower rates then students with less coding and also accounted for slightly higher percentage of leavers four years after entering Grade 10.

Figure 17
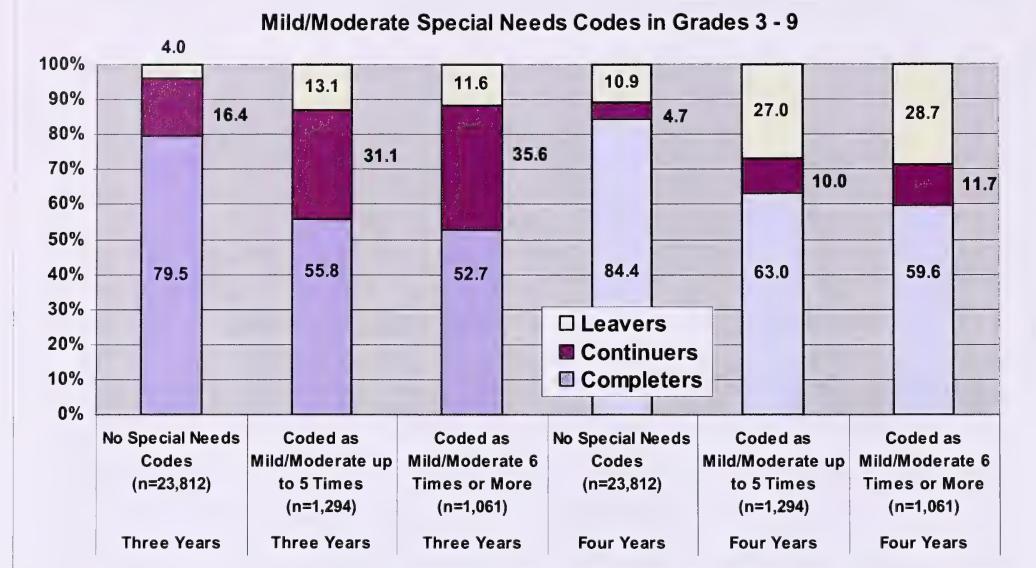
Mild/Moderate Special Needs Codes in Grades 3 - 9

4.0	13.1	11.6	10.9	27.0	28.7
16.4	31.1	35.6	4.7	10.0	11.7
79.5	55.8	52.7	84.4	63.0	59.6

Legend:
- □ Leavers
- ■ Continuers
- □ Completers

| No Special Needs Codes (n=23,812)	Coded as Mild/Moderate up to 5 Times (n=1,294)	Coded as Mild/Moderate 6 Times or More (n=1,061)	No Special Needs Codes (n=23,812)	Coded as Mild/Moderate up to 5 Times (n=1,294)	Coded as Mild/Moderate 6 Times or More (n=1,061)
Three Years	Three Years	Three Years	Four Years	Four Years	Four Years

Note: Each total column represents the overall number (100%) of students without special needs coding or with mild/moderate coding. The sections within each column are percentages of completers, continuers and leavers.

Finally, an observation can be made that the students who were coded as mild/ moderate special needs throughout Grade 3 to 9 (Figure 17) completed high school at approximately the same rates as students who were coded in Grades 7 – 9 only (Figure 16). This finding suggests that high school years may be the most challenging in addressing various special needs and helping students complete high school.

Discussion and Policy Implications: The major finding resulting from analysis of high school completion data from the special needs perspective suggests that the issues associated with special needs might be easier leveled if diagnosed and addressed at the elementary school level. This, along with other findings outlined in this report points to the key formative importance of early school years for the ultimate later successes, such as high school completion. Consequently it is very important to diagnose various special needs early and concentrate necessary resources to aggressively address these needs in elementary school or prior.

The data also indicate that even mild or moderate special needs (especially in high school) do have a noticeable negative association with high school completion. This points to a large potential area for improvement, including giving the issue a thorough empirical examination, such as exploring the links of various types of special needs to high school completion, and developing and testing innovative educational and other approaches targeting specific groups of special needs students.

These findings and conclusions might, however, have certain limitations due to the inconsistencies in assigning special needs coding. For example, the diminishing of special needs coding as students get older (e.g., after they complete elementary program and start junior-high school) might be due to lack of tracking, and the needs (e.g., literacy) could still exist but remain unaddressed.

HIGH SCHOOL COMPLETION BY SCHOOL TYPE

Figure 18 illustrates differences in high school completion outcomes depending on the type of the reporting school. The data indicate that a relatively small proportion of the cohort senior high students were reported at some type of specialized schools; the vast majority of them (96%) were in regular public, separate or Francophone schools.[5] The data reveal much lower percentages of eventual high school completers in any type of specialized programs. While students reported in "regular" schools accounted for 13.4% of high school leavers by the end of the fourth year after entering Grade 10, almost half of the students from outreach, special needs and other specialized schools did not complete high school and over a third of students in virtual or home education left without completing.

It should be kept in mind, however, that the described results constitute preliminary findings and a caution should be exercised in their interpretation. First, the available data provide only a "snapshot" of senior high students, and the previous school moves and types of programs are not accounted for. In addition, the students reported primarily in some type of specialized programs represented a small group in the examined cohort and the compared student groupings are very different in size.

Figure 18
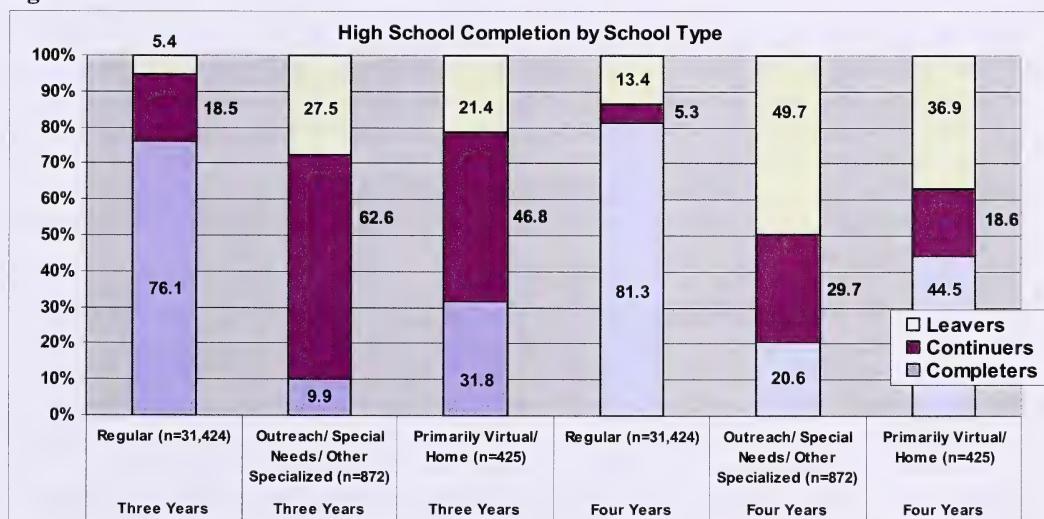
High School Completion by School Type

Note: Each total column represents the overall number (100%) of senior high students reported in regular, outreach/special needs/other specialized or primarily virtual and home education programs. The sections within each column are percentages of completers, continuers and leavers within each of these student categories.

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[5] Regular programs can be blended with some other programs (e.g., students taking online courses), but the majority of these students' credits were obtained at "regular" schools.

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Discussion and Policy Implications: While it is not surprising that students in outreach, special needs-oriented and other specialized schools don't complete high school at the rates approaching students in regular schools (taking into account these students' special personal and other circumstances), very low completion rates in this school category beg for further focusing on improving programming and counseling for the students who do not succeed in conventional school settings. At the same time the data indicate that outreach programs clearly assisted some students to complete. The available data suggest as well that primarily virtual or home schooling also did not work well for the cohort students in terms of high school completion. Other options, such as various blends with regular programs may prove to be more promising and their outcomes need to be examined and compared with other types of programming to generate the empirical evidence.

Although, as mentioned, the results presented in this report represent only a "snapshot" perspective, they echo the "grassroots" experiences and practices of some school districts, which encourage student transition from specialized programs back into traditional high schools (Herklotz & Starko, 2008). This already available Alberta-based experience (e.g., through AISI research and practices) should be taken into account.

HIGH SCHOOL COMPLETION BY SCHOOL GRADE CONFIGURATION

Before running the analyses of high school completion depending on the reported schools' grade configuration the following initial data selections were made:

- Only cohort students reported in "regular" schools were selected for the analysis, since they (hypothetically) could be most affected by the variations in grade configuration. Thus, students who were reported in primarily virtual or home education programs were removed from the analysis, as well as the students who were reported in outreach or other alternative schools. (For this last group of schools grade ranges might be customized to meet the needs of this specific group of students).
- In addition, only students with uninterrupted Alberta registration (starting from Grade 3) prior to entering Grade 10 were selected for the analysis, since some grade ranges covered Grades 1-12 and 7-12.

The vast majority of the cohort students (30,312 students in total, or 93%) made the mentioned selections (i.e., students who were reported in regular schools, were registered in Alberta in *every* school year from Grade 3 through 10 and therefore had no registration "gaps"). Breaking of this initial selection of students by school grade configuration (schools delivering Grades 1-12, 7-12 or 10-12 did not show notable variations in high school completion, because some students could migrate between schools and have no consistent association with a particular school grade configuration. Therefore, the following specific groups of students were extracted from the data: (1) students who were *consistently* registered from Grade 3 through 10 in a school delivering Grades 1 through 12; (2) students who were consistently registered in a junior-senior high school in Grades 7-10; (3) students who started Grade 10 in one of the schools teaching Grades 10-12 only and students who did not fall into the mentioned three categories labeled as "Other" (Figure 19).

Figure 19

High School Completion Results by Grade Configuration

	Three Years				Four Years			
Leavers	3.4	2.9	4.3	6.6	8.3	9.1	11.8	15.5
Continuers	10.4	13.9	17.3	21.0	2.7	3.1	5.1	5.9
Completers	86.2	83.2	78.4	72.4	89.0	87.8	83.1	78.6

Categories: Regular Schools Teaching Grades 1-12 (n=1,111); Regular Schools Teaching Grades 7-12 (n=2,035); Regular Schools Teaching Grades 10-12 (n=17,212); Other (n=9,967) — for both Three Years and Four Years.
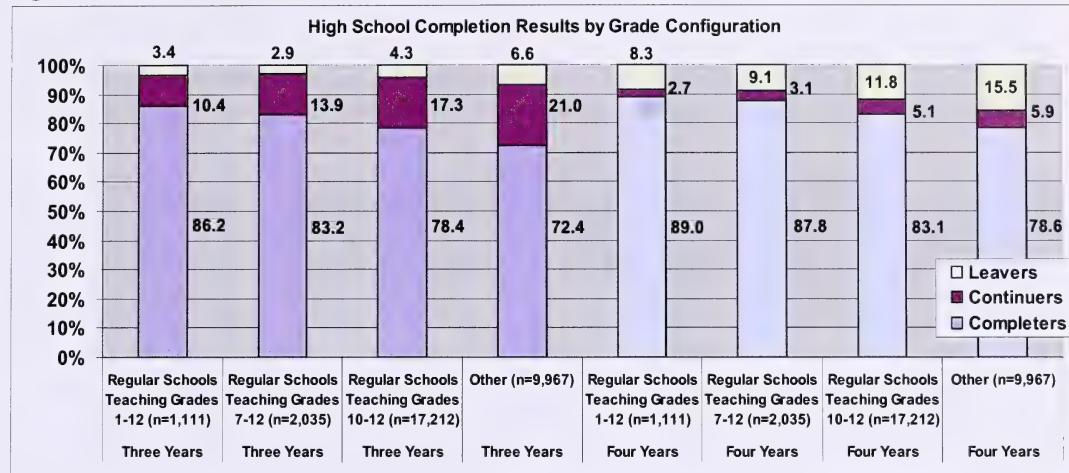
Note: Each total column represents the overall number (100%) of senior-high students in regular schools teaching Grades 1-12, 7-12, only 10-12, and students who did not fall into these categories grouped into the Other category. The sections within each column are percentages of completers, continuers and leavers within each of these student categories.

The resultant comparisons reveal moderate, albeit noticeable differences in high school completion outcomes "in favor" of the students with continuous registrations in schools that covered Grades 1-12, followed by the students from schools which combined junior and senior-high grades. The students from exclusively senior high schools (Grades 10-12) performed at the lower level compared to their counterparts from schools delivering Grades 1-12 and Grades 7-12. The "other" group showed the lowest high school completion rates. This is not surprising, given that it would incorporate a "mixture" of students with various registration histories and patterns, some of whom may be highly mobile. The differences in eventual high school leavers varied less by the grade configuration, with high school students reported in schools teaching Grades 10-12 or comprising the "other" group accounting for relatively high percentages of continuers, who neither dropped out, nor completed high school.

Splitting the grade configuration data by school size categories based on total school student population revealed that the largest proportion of students who were reported in schools covering Grades 1-12 (over 80 percent) concentrated in relatively small schools with total population ranging between 201 and 600 and small proportions of these students were reported in relatively large schools (601 students and more). Conversely, the vast majority (close to three quarters) of students who were reported in schools teaching only Grades 10-12, concentrated in large schools having 1,000 or more students. Alternative school data alignment by student population only in Grades 10-12 confirmed that the secondary students reported in Grade 1-12 schools were more likely to be in schools with both relatively small total student population and also with smaller number of students in senior high grades.

It would be reasonable to suggest that these results might attest to the negative impacts of large school size on student outcomes, such as high school completion. However, the available data did not reveal a notable association between school size by itself and high school completion (see the following section of this report). Therefore, variables such as grade configuration and school size may be part of a dynamic interplay of an array of interrelated factors that have a cumulative effect

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on high school completion. Hence, it is advisable to consider the effects of student mobility, school environment and other variables in relation to school characteristics such as grade configuration or school size. For example, a student registered consistently with a single Grade 1-12 school is also a low mobile student. Low mobility (which is associated with stable school social and academic environments) has a positive relationship with student achievement and high school completion.

Discussion and Policy Implications: The available data supported the assumption that consistent school environments, including stable relationships (e.g., with teachers and peers) that Grade 1-12 schools are able to offer may have some positive association with student outcomes, including high school completion (given the students have a good fit or "match" with their school environments and maintain steady registration with the same school). Students in such schools could develop stable social and academic relationships with teachers and peers and have a chance to maintain favorite extracurricular engagements. These types of relationships and social supports may be especially important to students with unstable or unsupportive family backgrounds. Favorable and consistent school environments could translate into stronger student connection to school and thus into higher school completion rates. Junior-senior-high (Grade 7 - 12) schools also have a potential of offering consistent, multi-year school environments to their students.

Additionally, the data demonstrated that the majority of secondary students reported in Grade 1-12 schools were in relatively small schools, with small senior-high student populations. Relatively smaller school sizes may be conducive to the development of more unofficial, "homey" school environments, but this does not mean, however, that supportive social and academic atmosphere is unattainable in larger schools.

Conversely, transferring to "specialized" (Grades 10-12) senior-high schools may require major social and academic adjustments from students, along with the pressure of meeting high academic demands as well as dealing with family, work and other outside-of-school issues. In addition, such schools may have less opportunities of creating a consistent, supportive atmosphere for their students. These multiple factors may result in a weak student connection to school, lack of motivation to stay in school and eventually, in lower high school completion rates.

The differences in students' academic and other outcomes depending on schools' grade ranges need to be further researched and the above-mentioned propositions tested. Since the mentioned potential positive effects of Grade 1-12 and Grade 7-12 schools may be conditioned on low student mobility, the relationship to high school completion should be controlled for this variable (e.g., see the section on multiple regression analysis in the end of this report). The resultant findings should be considered in school restructuring policies and new school development planning. It is important to keep in mind that evidence-based improvements in schools' grade configurations need to go hand-by-hand with strategies to decrease student mobility. The potential benefits of consistent school environments would fade away if students frequently move between schools.

HIGH SCHOOL COMPLETION AND SCHOOL SIZE

In order to counteract the effect of outreach and other specialized/special needs schools, which tend to have relatively small numbers of students (and hence could influence the high school completion outcomes for the schools with low student populations), only students reported in regular programs were selected for the analysis. School size is measured as average total student population in a school in 2003-05. The results of analysis of the cohort data did not reveal a notable, consistent association between school size and high school completion (Figure 20). The differences in high school completion rates were slight and hovered between one and three percent. Differences in the proportions of high school leavers were also very slight and normally did not exceed one percent.

Figure 20

High School Completion by School Size
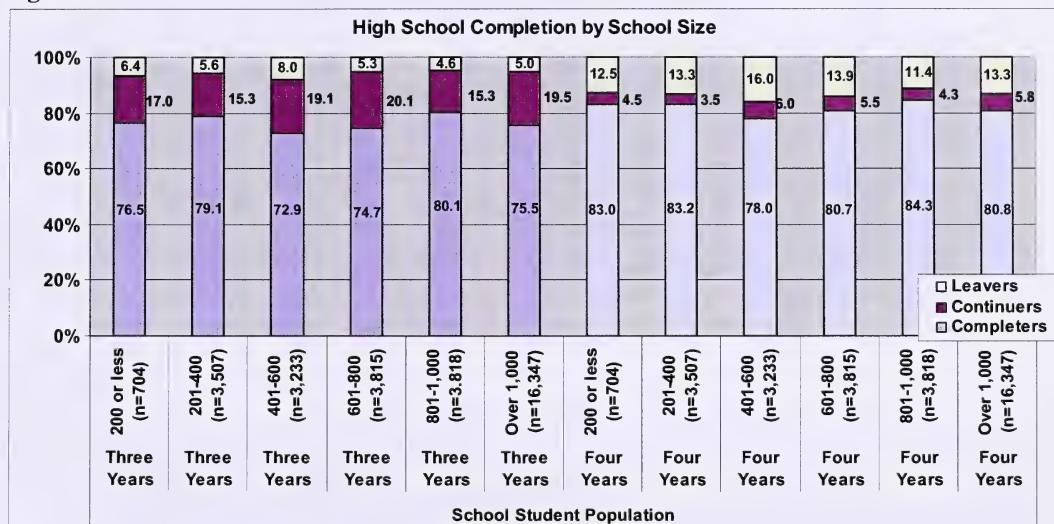
Note: Each total column represents the overall number (100%) of senior-high students in various school size categories. The sections within each column are percentages of completers, continuers and leavers within each of these categories.

Discussion and Policy Implications: The project cohort data did not reveal a notable association between school size by itself and high school completion. However, considering school size in combination with other variables, such as school grade configurations and other specific school characteristics and contexts (e.g. urban versus rural schools - see the analysis by school geography below) may provide more insights into and understanding of this factor.

Both relatively large and small school settings may possess distinctive characteristics that could have a positive or negative association with high school completion. Smaller schools, for instance, may offer more friendly, informal environments for their students, but, on the other hand, lack the variety of program choices to meet students' academic or career needs. Larger schools, on the other hand, may offer rich programming while lacking individualized, caring approaches to students. These contrasting variations in schools' milieus may account for the lack of appreciable association between high school completion outcomes and school size at least in the examined cohort.

HIGH SCHOOL COMPLETION BY TEACHER EXPERIENCE

By analogy with other sections of this report, data on students who were reported primarily in virtual or home education programs were removed from the analysis of association between average teacher experience and high school completion (Figure 21). Average (school-wide) years of teaching experience were reported for the 2002-03 school year, when the cohort students entered Grade 10. A small proportion of students (5%) were reported in schools with relatively few average years of teaching experience – 10 years or less. The vast majority of students were in schools with teachers averaging 10.1 to 15 years of experience or 15.1 or more years.

Figure 21
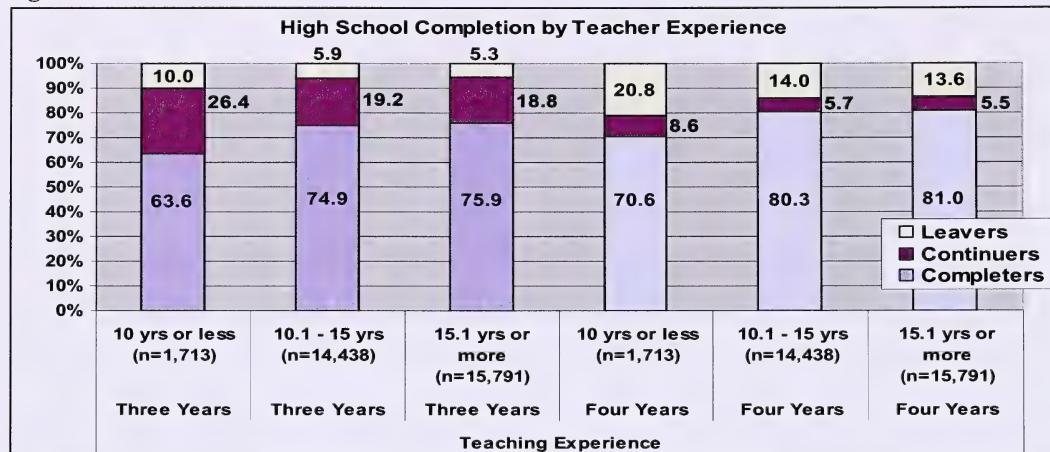
Note: Each total column represents the overall number (100%) of senior-high students in schools with various average years of teaching experience. The sections within each column are percentages of completers, continuers and leavers within each of these student categories.

Substantially higher percentages (up to 10-12 percent more) of high school students from the schools with relatively more experienced teachers (over 10 years of teaching) completed high school compared to students from the schools with less experienced teachers (10 or less years). As well, higher percentages of students in schools with the least average years of teaching experience did not complete high school or dropped out.

Discussion and Policy Implications: The cohort data indicate an essential role of teaching experience in increasing high school completion rates. Ten years of average teaching experience appear to be a key "threshold" after which the associated differences in high school completion tend to level out.

While the data suggest relatively low proportions of less experienced teachers in the schools teaching senior-high grades, it also shows that half of cohort students were reported in schools with teachers averaging over 15 years of teaching experience in 2003 and hence, approaching retirement. Although the cohort results can not be directly projected on the total education system, these findings may constitute a "red flag" that may point to key policy implications for teacher preparation and professional development. A major influx of young, relatively inexperienced teachers ten years from now or earlier may have major implications for high school completion outcomes. Consequently, strategies such as in-servicing, job shadowing and other experience and skills transfers from more experienced teachers to novices need to be implemented both at schools and universities. Also, professional development targeting specifically high school completion and associated factors could prove to be useful for organizing young teachers' efforts and teaching strategies around the ultimate, key goal of high school completion.

DIFFERENCES IN HIGH SCHOOL COMPLETION BY SCHOOL GEOGRAPHY

High School Completion by Rural and Urban Locale

The Alberta schools were assigned urban or rural codes based on Statistics Canada 2001 Census data. Urban/rural codes were assigned based on school postal codes. Schools were classified as urban if they were located in one of the following: (1) urban core - a large urban area having a population of at least 10,000 (e.g., Medicine Hat, St. Albert, Edmonton); (2) urban fringe - the area within a larger urban area (i.e. a Census Metropolitan Area) that is not directly bordering the urban core (e.g., Beaumont, Devon); (3) urban area outside the urban core (e.g., Drumheller, Hinton) and (4) rural fringe - all territories within a larger urban area (i.e. a Census Metropolitan Area) that is not classified as urban core or urban fringe (e.g., Calmar, Morinville). Schools in rural areas outside the mentioned areas were categorized as rural.

Figure 22 shows high school completion rates for cohort students in schools split by the mentioned general urban and rural categories. All data were analyzed, except for the information on students who were reported primarily in virtual and home education (and hence could not be tied to a particular geographic location). Students from rural schools showed slightly better high school completion rates compared to their urban counterparts (approximately a two percent difference). Urban schools also had slightly higher percentages of continuers who did not leave school, but had not completed high school either, both after three and four years following entering Grade 10. At the same time, the percentages of leavers were almost the same for urban and rural schools.

Figure 22
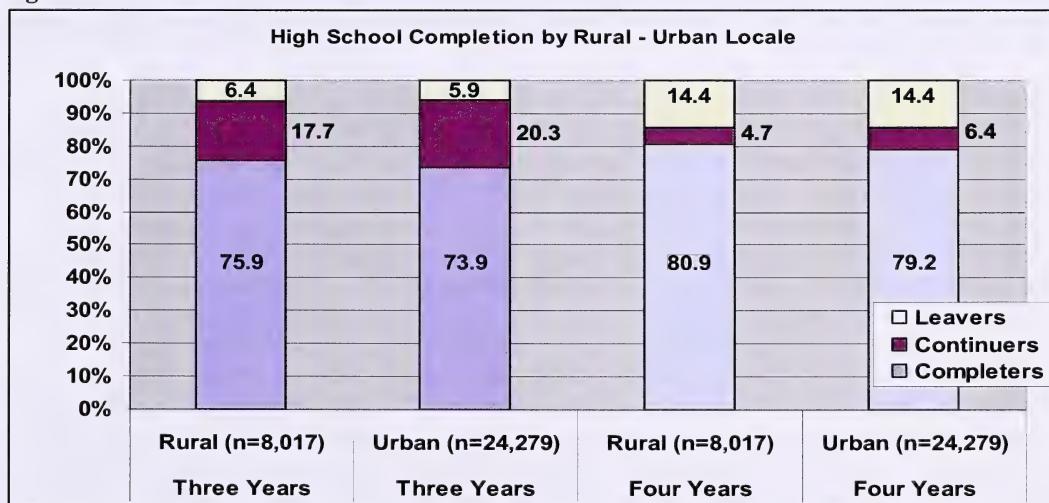
Note: Each total column represents the overall number (100%) of senior-high students in rural and urban schools. The sections within each column are percentages of completers, continuers and leavers within each of these student categories.

Further splitting urban schools into four categories according to their community size (Figure 23) provides a more detailed insight into high school completion variations in different types of urban locales. Students in schools in large cities (with population exceeding 100,000) were generally

distinguished by the lowest high school completion, which is not surprising given, for example, the education issues in Edmonton and Calgary city cores and presence of specialized high schools serving mature students. On the other hand, relatively small urban locales with population under 25,000 emerged as the places with the highest high school completion. While the mentioned differences did not exceed 4%, they deserve attention in view of raising high school completion.

Figure 23

High School Completion by Size of School Community

	Rural (n=8,017)	Urban <25,000 (n=3,569)	Urban 25,000-100,000 (n=5,327)	Urban>100,000 (n=15,383)	Rural (n=8,017)	Urban <25,000 (n=3,569)	Urban 25,000-100,000 (n=5,327)	Urban>100,000 (n=15,383)
Leavers	6.4	5.7	5.8	5.9	14.4	13.0	14.1	14.8
Continuers	17.7	17.3	19.1	21.4	4.7	4.7	5.2	7.2
Completers	75.9	76.9	75.0	72.7	80.9	82.3	80.7	78.1
	Three Years	Three Years	Three Years	Three Years	Four Years	Four Years	Four Years	Four Years
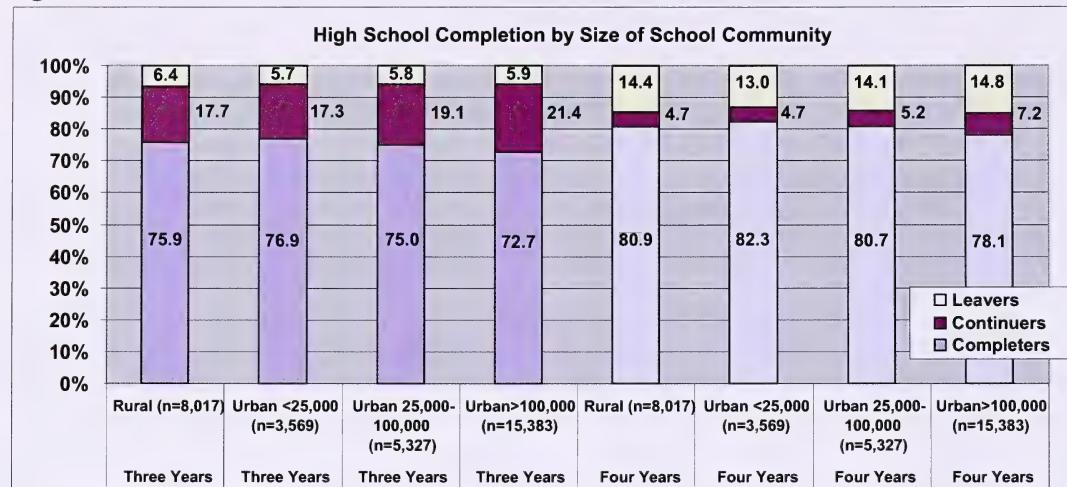
Note: Each total column represents the overall number (100%) of senior-high students in rural schools and schools in urban communities of various size. The sections within each column are percentages of completers, continuers and leavers within each of these student categories.

Although the results of analysis presented in the preceding section of this report did not show substantial general variations in high school completion outcomes depending on just school size during senior-high studies (Figure 20), splitting urban and rural school data by school size revealed noteworthy patterns. For example, the majority (65%) of students from relatively small urban centers (under 25,000) who demonstrated the best high school completion results, tended to concentrate in medium-size schools with total populations ranging from 401 to 1,000 students. At the same time, students in large urban centers who showed the lowest high school completion rates, concentrated mainly in large schools with total populations exceeding 1,000 students (85% of these students). Therefore, it is reasonable to suggest that school size analysis is incorporated in comprehensive examinations of different contexts and variables that may affect high school completion. However, the results of data analysis presented in this report suggest that approach to school size from a "uni-dimensional" perspective, such as "the smaller the better" does not reflect the complex reality of the contemporary education system. For example, as illustrated in Figure 23, cohort senior-high students from rural communities completed high school at a slightly lower rate than their counterparts from small towns or cities with population under 25,000. Almost half (44%) of these rural students were in the smallest schools with total population under 400 students, compared to only 20% of the mentioned small town/city students, which were the top performers among all urban-rural categories and concentrated mainly in middle-size schools with 401 - 1,000 students.

Discussion and Policy Implications: The data analysis revealed that senior-high students from rural and relatively small town/city schools (especially in urban communities with population under 25,000) tended to complete high school at somewhat higher rates than students from the largest cities (with population over 100,000). These results emerged despite of the perception of rural or small town/city schools as lacking comparable infrastructure and facilities as well as having greater potential for experiencing personnel shortages.

Adding a school size perspective to the analysis demonstrated that it would be useful to consider school size not by itself, but in conjunction with other variables that could be linked to high school completion. For example, small schools, which are commonly associated with rural settings, are generally believed to be conducive of providing personalized educational environments for their students who may develop stronger school engagement. Stronger connection to school, in turn, may contribute to high school completion. However, not all rural and small town schools (which in general were found to have relatively high school completion rates) are small. Some of them accommodate quite large numbers of students, who are brought in from surrounding areas. Furthermore, the data demonstrated that students from small urban communities (under 25,000) who showed the highest high school completion outcomes tended to concentrate not in small, but rather in medium size schools ranging from 401 to 1,000 students in total. Thus, it is reasonable to explore the concept of "optimal" school size rather than juxtaposing attributes of small and large schools. This optimal school size should not be lower than a certain minimal threshold (which would make a diversity of programs and services feasible), but at the same time should not be too large for cultivating a personal approach to individual students' needs.

In addition, there also might be other factors pertinent to better high school completion outcomes in rural and especially small city/town schools, besides just school size, and these possible common attributes need to be unearthed and further researched.

High School Completion by Particulars of Local Economic Environments: Proximity to the Economically Advancing Areas with Well-paid Jobs and Labor Shortages

There is a common belief that a booming economy offers high earnings to young people (especially males) and therefore distracts them from finishing high school. In order to test this "anecdotal information" the data on schools' proximity to the fast growing oil production based on bitumen sands in Northern Alberta were collected and high school completion outcomes were analyzed according to this geographic attribute. The geographic spread of growing oil regions and high schools' proximity to them was determined based on the counties' economic profiles, as well as on other literature on the recent oil resource developments in the province. Then the schools where the cohort students' high school completion results were reported were classified according to their location either in the areas experiencing the recent "oil boom" or in the remaining localities.

Data analysis (Figure 24) provides some support to the mentioned hypothesis, but the variations in high school completion outcomes were not drastic – 3% lower in the booming oil regions then the rest of the province three years after entering Grade 10 and 2% lower after four years. By analogy, "booming" areas had only 2% more leavers by the end of the third and fourth year compared to the rest of the province.

Figure 24
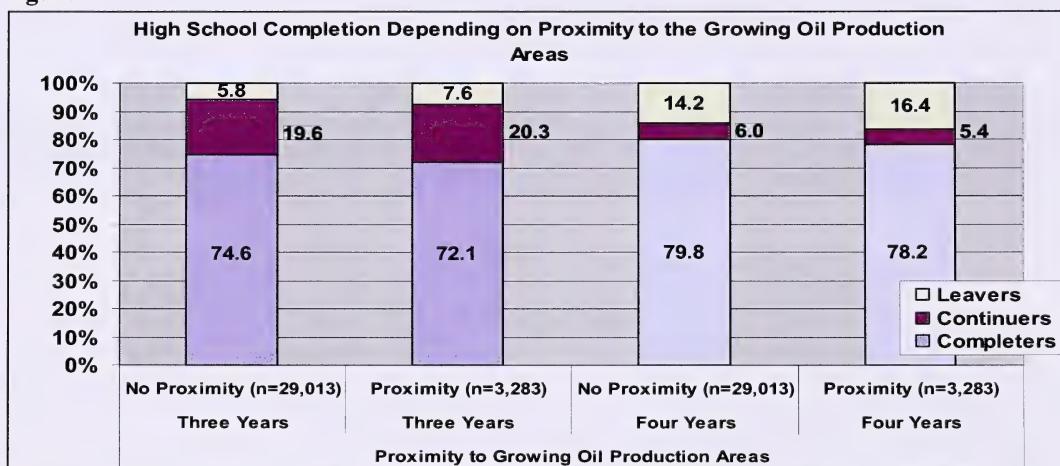
Note: Each total column represents the overall number (100%) of senior-high students in schools in proximity or outside of the areas (counties) experiencing recent oil production growth. The sections within each column are percentages of completers, continuers and leavers within each of these student categories.

Splitting the data by gender (Figure 25) produced unanticipated findings. Contrary to expectations based on the grassroots feedback, which suggests that typically males tend to leave school early to capitalize on the local job opportunities, high school completion among *females* showed some negative association with the proximity to growing oil areas. Senior-high males reported in schools close to the mentioned regions showed virtually no difference in high school completion compared to males from other areas. In summary, these explorative results may indicate that in general, irrespective of the local economic conditions, higher percentages of males compared to females tend to leave school early (probably to take a job among other reasons). However, females from the high schools in vicinity to the "booming" regions could be somewhat more prone to leaving

school early than females from other parts of the province (also, hypothetically, probably due to the available job options or other socio-economic related reasons).

Figure 25

High School Completion Depending on Proximity to Growing Oil Production Regions and Student Gender

□ Females No Proximity (n=14,264)
■ Females Proximity (n=1,571)
□ Males No Proximity (n=14,749)
▨ Males Proximity (n=1,712)
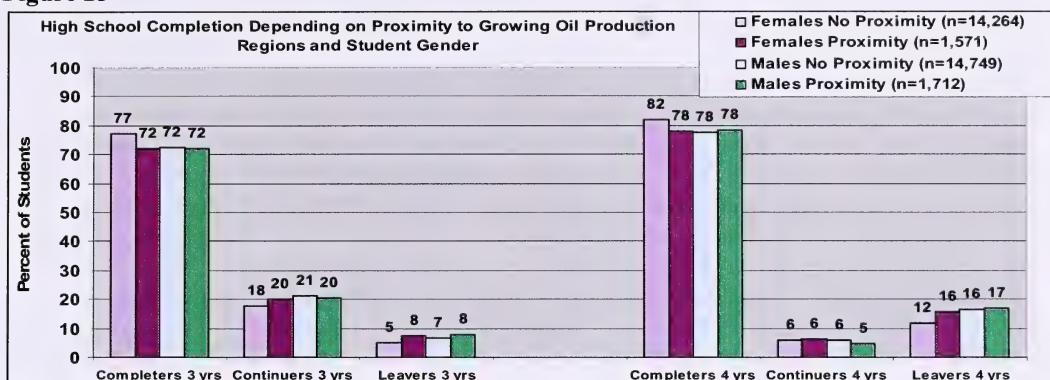
Note: Each column represents the percentage of male and female high school completers, continuers and leavers in schools in proximity or outside of the areas (counties) experiencing recent oil production growth.

These findings should be considered preliminary and exploratory only. The outcomes of data analyses may depend on how the data were defined. This study focused on geography of rapidly expanding oil activity that might be perceived as reason for students leaving school and on comparing schools in these regions to the rest of the province. However, rapid development of other Alberta industries and supporting activities, such as construction or service industries elsewhere, could also affect high school completion. Thus, it is suggested that other potential predictors of high school completion be examined in the future, such as geographic variations in unemployment rates. Also, with contemporary easy information flows and swift communication, it is possible that effects of economically booming "enclaves," such as Northern Alberta oil sands can extend far beyond their geographical borders, and high school completion all over the province may be affected.

Discussion and Policy Implications: The cohort data indicate that there could be some negative effect of high labor demands triggered by rapid economic growth on high school completion. However, economic growth may be not as powerful a high school completion detractor as it might seem. Since males generally are more likely to leave school early and frequently cite work-related motives, the reasons for dropping out of school may be largely gender-based. Hence, before coming to a final conclusion, this issue needs to be further investigated using different economic variables and comparing the results. In addition, there is a possibility that economic factors intermingle with other variables, such as student orientation to school, course programming and family socio-economic status. Therefore, it is advisable not to single out the economy-related factors at this point, "blaming" them exclusively for students leaving school, but consider them conjointly with other issues.

Whether economic factors are found to be influential in local high school completion outcomes or not, developing constructive relationships with local business communities and industries could have a positive effect on the overall situation with high school completion. For example, incorporating skills congruent with local economic profiles in career-related courses, as well as providing high school students with the opportunities to develop work expertise, get credentials and earn money in co-op programs, may prompt more potential leavers to stay in school and attain high school completion. Positive relationships could also work the other way – i.e., convincing employers not to schedule students during school hours.

High School Completion by Direct Proximity to Colleges and Universities

In order to explore the possible association between a school's position in the vicinity of post-secondary institutions, such as colleges and universities with high school completion outcomes, a "direct proximity" (to a college or university) variable was developed indicating whether the schools were located in the communities which had a university or at least one college campus or site. The universities included University of Alberta, University of Calgary and University of Lethbridge (therefore all schools in Edmonton, Calgary and Lethbridge fell into the "direct proximity to a university" category). Students in the communities which incorporated campuses or sites of Northern Alberta Institute of Technology (NAIT), NorQuest College, Lakeland College, Northern Lakes College, Keyano College, as well as Canadian University College, Fairview College, Grande Prairie Regional College, Medicine Hat College, Olds College, Portage College and Red Deer College were categorized as being in the "direct proximity" to a college. The data presented in Figure 26 offer initial, explorative insights into the relationship between the territorial proximity of post-secondary institutions to schools delivering secondary programs and high school completion. This study focuses only on a "direct proximity" (i.e., schools being in the same community with a university or college), due to the difficulty to determine broader "catchment areas" for each particular post-secondary institution. A small group of cohort students, whose high school completion results were reported in virtual or home schooling, were left out of the data analysis.

Figure 26
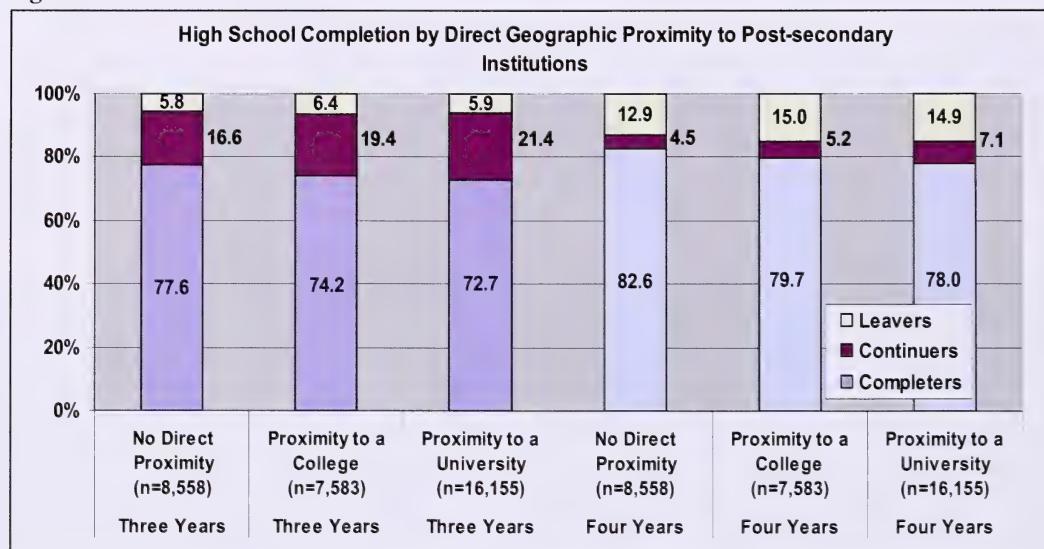
High School Completion by Direct Geographic Proximity to Post-secondary Institutions

Note: Each total column represents the overall number (100%) of senior-high students in schools inside or outside of the communities having a college/college site or a university. The sections within each column are percentages of completers, continuers and leavers within each of these student categories.

At first glance, the results of analyses appear to be counterintuitive to the original hypothesis that direct proximity to a college or university should be conducive to higher school completion rates (since it is reasonable to suggest that high school students who live or study close to postsecondary institutions should be aware of the related opportunities). The data showed, however, that in general students reported in high schools that were closest to the universities and colleges tended to

have somewhat lower high school completion than students in schools outside the "direct geographic proximity" range identified in this study.

The mentioned differences in high school completion were not drastic (approximately five percent or less) and can be interpreted as follows:

- First, proximity to large universities (i.e., University of Alberta and University of Calgary) do not automatically mean better awareness of and opportunities for post-secondary studies for all students, especially for low socio-economic status (SES) groups (e.g., students from the city core schools). The results of high school completion data analysis by urban and rural locales discussed in the preceding parts of this report support this thesis. Namely, cohort students in the largest provincial cities with population over 100,000 (Edmonton and Calgary) generally had the lowest high school completion outcomes, whereas students from rural and urban locales with population of less than 25,000 had the highest outcomes. Further studies will be needed with students in the city cores identified separately to fully substantiate this point.
- Second, students' awareness of and orientation towards post-secondary education and, consequently, towards finishing high school, may depend on the degree of the individual post-secondary institutions' engagement and co-operation with the surrounding school system (e.g., universities reaching to schools and offering information or activities for students, or colleges helping with trade courses).

Discussion and Policy Implications: The possible effects of a college or university geographic proximity to schools on high school completion and associated factors should be further examined and communicated to Advanced Education and Technology to take maximum advantage of such proximity in order to increase high school completion and/or post-secondary engagement. For example, the following questions need to be answered and related issues (if any) addressed:

(1) Is there a possibility of some post-secondary institutions being "disengaged" from their surrounding school communities, with the schools having no strong or exclusively focused connection to the local post-secondary base, including information and training resources?

(2) What is the current recruitment information focus of Alberta universities and colleges? Is it possible that rural and (remote) small urban areas have been considered a priority, given a perception of them as the most disadvantaged areas, at the expense of the low SES (highly) urbanized locales? No matter how hard colleges and universities could try to recruit low SES students, a large portion of them would be eventually left out from the post-secondary opportunities due to high school non-completion. Therefore, the role of post-secondary institutions should extend beyond the recruitment of high school graduates to helping schools in establishing career goals for disadvantaged students. Having a clear view and plan for future career paths may encourage many "at risk" students to stay in and complete school.

HIGH SCHOOL COMPLETION BY JURISDICTION SIZE

Figure 27 shows high school completion rates depending on jurisdiction size. Data on students who were reported primarily in virtual or home education programs were excluded from the analysis. Jurisdiction size is measured as average total student population in a jurisdiction in 2003-05.

Figure 27

High School Completion by Jurisdiction Size

	Under 5,000 Students (n=5,259) Three Years	5,000-9,999 (n=9,186) Three Years	10,000-19,999 (n=2,766) Three Years	20,000-49,999 (n=4,575) Three Years	Over 50,000 Students (n=10,510) Three Years	Under 5,000 Students (n=5,259) Four Years	5,000-9,999 (n=9,186) Four Years	10,000-19,999 (n=2,766) Four Years	20,000-49,999 (n=4,575) Four Years	Over 50,000 Students (n=10,510) Four Years
Leavers	6.7	6.1	4.3	5.6	6.2	14.3	14.4	11.5	13.0	15.8
Continuers	17.0	18.9	17.2	19.6	22.3	4.4	5.1	5.1	7.0	7.3
Completers	76.3	74.9	78.5	74.9	71.5	81.2	80.5	83.4	80.0	76.9

Note: Each total column represents the overall number (100%) of senior-high students in jurisdictions of different size. The sections within each column are percentages of completers, continuers and leavers within each of these student categories.

High school completion clearly varied depending on jurisdiction size, the largest jurisdictions being behind the smaller ones. By the end of the fourth year after entering Grade 10, 80% or more of cohort students from jurisdictions totaling less than 50,000 students completed high school compared to only 77% of students from the largest jurisdictions (over 50,000 students). Although the differences were not drastic – maximum seven percent – they were consistent with the findings based on other student populations (e.g., Sable, Gaviola & Hoffman, 2007). Also, it is important to keep in mind that even slight percentage differences in high school completion in large jurisdictions translate into thousands of students who do not complete high school.

Discussion and Policy Implications: In spite of a conventional perception of smaller, primarily rural jurisdictions as experiencing shortages in educational resources and other supports, the cohort students from these districts tended to complete high school at a higher rate than students from the largest, mostly urban, districts. These results are corroborated by and linked to the finding that students from smaller communities were more likely to complete high school at higher rates than students from large urban centers. It follows from this finding that a balanced, targeted approach needs to be maintained towards raising high school completion in various districts. For instance, while mostly rural, small jurisdictions may require focusing on staffing, infrastructure and programming (including ensuring a broad choice of work-related courses), large districts may struggle with issues associated with low SES schools, school overcrowding due to fast populations growth, and so on. Therefore, both small and large jurisdictions need equally intense, but customized assistance in their distinct quests to keep students in school and help them graduate.

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Research literature points to a link between socio-economic status (SES) and student academic outcomes and educational trajectories (e.g., Adams & Ryan, 2000; Dahl & Lochner, 2005; Magnuson, K., 2003; Morris, Duncan & Rodrigues, 2006; van Zanten, 2005). This study examines how high school completion is associated with the key SES variables, such as average family income, parent (mother's) education, family composition and dwelling ownership. The analyzed SES variables are aggregated at the school level reflecting students' residence, based on 2001 census data, which were collected close to the time when the cohort students entered Grade 10 (in 2002). All cohort students were included in the following data analyses, except for 132 students from schools with missing SES data (in all 32,589 students).

Data in Figure 28 reveal a clear link between high school completion and family income. Schools characterized by relatively high average family income yielded notably higher proportions of high school completers than lower SES schools. The maximum difference between high school completion rates in the schools with the lowest average family income (under 50,000) and schools with the highest average family income (over 90,000) was about 20% both three and four years following entering Grade 10.

Figure 28
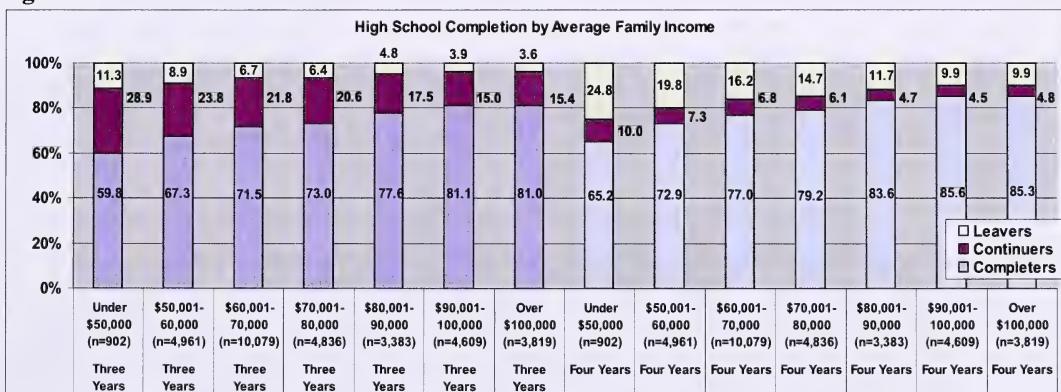
High School Completion by Average Family Income

Note: Each total column represents the overall number (100%) of senior-high students in schools with different average family income. The sections within each column are percentages of completers, continuers and leavers within each of these student categories.

Figure 29 illustrates the link between average years of mother's education and high school completion. Only a small proportion of students (733 students or 2% of the cohort) were reported in schools with average years of mother education of 12 years or less. The majority of students (23,402 or 72%) did their senior-high studies in schools distinguished by average mother's education ranging from 12.1 to 14 years and additional 8,454 students (26%) were reported in schools with average mother's education exceeding 14 years. The high school completion rates were consistently higher and dropout rates lower for students in schools with more educated mothers.

Figure 29
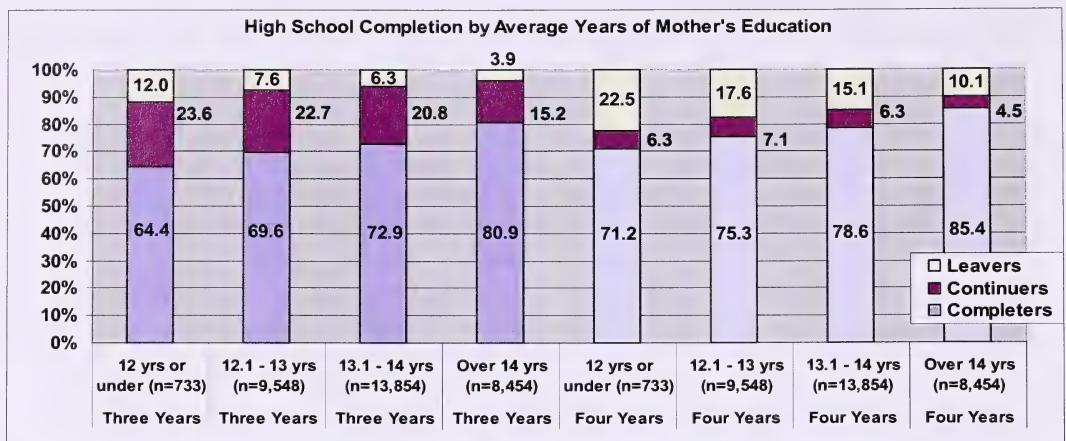
High School Completion by Average Years of Mother's Education

|	12 yrs or under (n=733) Three Years	12.1 - 13 yrs (n=9,548) Three Years	13.1 - 14 yrs (n=13,854) Three Years	Over 14 yrs (n=8,454) Three Years	12 yrs or under (n=733) Four Years	12.1 - 13 yrs (n=9,548) Four Years	13.1 - 14 yrs (n=13,854) Four Years	Over 14 yrs (n=8,454) Four Years
Leavers	12.0	7.6	6.3	3.9	22.5	17.6	15.1	10.1
Continuers	23.6	22.7	20.8	15.2	6.3	7.1	6.3	4.5
Completers	64.4	69.6	72.9	80.9	71.2	75.3	78.6	85.4

Note: Each total column represents the overall number (100%) of senior-high students in schools with different average years of mother's education. The sections within each column are percentages of completers, continuers and leavers within each of these student categories.

As illustrated in Figure 30, high school completion was negatively linked to being a child from a lone parent family. Senior high students who were reported in schools characterized by the lowest average percent of lone parent families had notably higher completion than their counterparts from schools where the average proportions of lone parent families were higher. The largest high school completion gap was observed between a small group of students from the schools with the highest average proportion of lone parent families (over 30%) and students from the schools where concentration of such families was the lowest (15% or less). However, the majority of cohort students (26,194 or 80%) concentrated in schools with relatively "moderate" average percentages of lone parent families, ranging from 15.1 to 25 percent.

Figure 30

High School Completion by Average Percent of Lone Parent Families

|	15 percent or less (n=2,500) Three Years	15.1-20 percent (n=12,549) Three Years	20.1-25 percent (n=13,645) Three Years	25.1-30 percent (n=3,358) Three Years	Over 30 percent (n=537) Three Years	15 percent or less (n=2,500) Four Years	15.1-20 percent (n=12,549) Four Years	20.1-25 percent (n=13,645) Four Years	25.1-30 percent (n=3,358) Four Years	Over 30 percent (n=537) Four Years
Leavers	5.7	5.2	6.4	8.1	15.6	12.2	12.4	15.3	19.3	33.1
Continuers	15.4	16.9	20.5	29.4	39.1	4.3	4.9	5.9	11.1	15.5
Completers	78.8	77.9	73.1	62.5	45.3	83.5	82.7	78.8	69.6	51.4

Note: Each total column represents the overall number (100%) of senior-high students in schools with different percentage of lone parent families. The sections within each column are percentages of completers, continuers and leavers within each of these student categories.

Congruent with other SES data (e.g., income), high school completion varied depending on average percent of families in owned dwellings (Figure 31). Senior-high students reported in schools where a third of the families or more (65% or under) did not own a home completed high school at the

rates that were around 25 percent lower compared to students from schools with the highest average home ownership rates (85.1 to 95 percent).

Figure 31
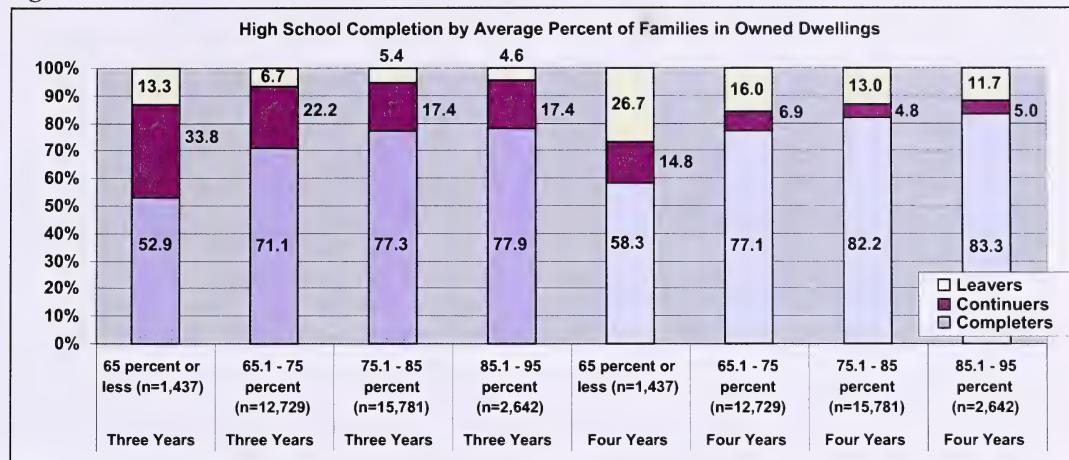
High School Completion by Average Percent of Families in Owned Dwellings

Note: Each total column represents the overall number (100%) of senior-high students in schools with different percentage of families in owned dwellings. The sections within each column are percentages of completers, continuers and leavers within each of these student categories.

Discussion and Policy Implications:

Bivariate data analysis indicated consistent links between high school completion and various aspects of socio-economic status (SES). It is worth accentuating that SES-based differences in high school completion were quite pronounced even for a relatively "stable" cohort of students, the majority of whom had been studying in Alberta from Grade 3 and did not include new arrivals. While these results may be disappointing for educational practitioners who cannot control SES variables, some policies, as Berliner (2009) has identified, may counteract negative effects of SES. The factors that may lead to a reduction in the gap between lower-class and middle/upper-class students are much more frequently present in the middle and upper SES schools (van Zanten, 2005). Therefore, lack of economic, cultural and social capital in low-SES residential areas may be (partially) offset if low-SES students are "mixed" with student populations from more affluent communities. Increased educational choice and accessibility (e.g., transportation) for disadvantaged students would enrich their cultural and social resources in terms of aspirations, values and social networks. "Evening out" access to these valuable resources is within the reach of educators as are pedagogical methods designed to offset the SES effects, especially for younger students.

On the other hand, the SES analysis shown here does not account (control) for the effects of other high school completion predictors examined in this report Therefore, as demonstrated by the following multiple regression analysis, simultaneous examination with other predictor variables may cast additional light at the role of SES in explaining high school completion results.

Preliminary bivariate analyses highlighted in the preceding sections focused on the individual factors that may be linked to high school completion. These analyses provided detailed, variable-by-variable, insights into this link, but cannot account for the complexity of the relationship involving all of the considered potential high school completion predictors, which may also interact with each other. A multiple logistic regression analysis allows simultaneous testing and modeling of multiple predictor variables and makes it possible to identify the key predictors of high school completion after controlling for the effects of other predictors.

A number of predictor variables were recoded or modified before proceeding with logistic regression analysis. For example, continuous raw measures of the results of Grade 9 combined English and French mathematics PATs were substituted for four categorical variables: Excellence, Acceptable and Below Acceptable level and also included students who did not write the test due to various reasons. Hence, the number of potentially missing cases was reduced (i.e., cases that would be omitted from the analysis if only the data on students who wrote the test were analyzed). On the other hand, unlike the bivariate results shown in Figures 20 and 27, school and jurisdiction size were entered into the regression model as continuous variables, in order to attain alternative, generalized, insights into their links to high school completion. The predictor variables' codes are detailed in Table 2.[6]

The data were analyzed using a sequential regression method, whereby predictors were organized and consecutively entered into the regression model in a set of four blocks based on the hypotheses about the analyzed association. Since this is not a completely explorative study and the effects of some of the included predictors have been examined in the research literature, this type of a theory-grounded approach to the analysis is preferable to the explorative, stepwise regression method. First, the variables related to individual students (e.g., PAT achievement, special needs/ESL codes, mobility and gender) were entered. Second, the school and jurisdiction-related factors were entered, followed by the predictors associated with schools' economic and geographic environment. The SES variables were entered last on purpose, so that the effects of school-related and environmental factors are accounted for first, since they may be more easily manipulated by targeted policies and strategies than SES variables. As a result, four increasingly complex regression models emerged. In order to simplify the reporting, only the final, fourth, model with all predictors entered is shown in Table 2 (see the columns under Sequential Method heading).

The regression analysis was run for two groups of students using high school completion data three and four years after entering Grade 10. First the data on the total cohort of students three years after

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[6] Categorical variables such as PAT Math 9, Special Needs, Grade Range and Rural-Urban Locales are coded as "dummy" variables. A dummy variable is a numerical variable used in regression analysis to represent subgroups of the sample in a study. In research design, a dummy variable is often used to distinguish different groups. Usually, we would use a dummy variable where students are given a value of 1 if they are in a certain group or a 0 if they are not in this particular group. Dummy variables are useful because they enable us to use a single regression equation to represent multiple groups. The described type of coding needs reference categories (see Table 2) which are omitted from the model. Each of the regression coefficients is a comparison with the omitted reference category. For example, for PAT Math 9 variable, the three categories - Below Acceptable Level, Excellence Level and Did not write due to various reasons - are compared to the Acceptable Level reference category.

Table 2. Binary Logistic Regression Coefficients for Analytic Models That Examine the Effects of High School Completion Predictors

Predictor Variables	Sequential Method		Stepwise Method	
	3 years	4 years	3 years	4 years
	N=30,120	N=5,568	N=30,120	N=5,568
PAT Math 9: categorical, dummy-coded (1 or 0); reference category - Acceptable Level				
Below Acceptable Level = 1	-1.22***	-0.42***	-1.22***	-0.41***
Excellence Level = 1	1.33***	0.39**	1.33***	0.35*
Did not write due to various reasons = 1	-1.46***	-0.45***	-1.47***	-0.47***
Mobility: continuous, number of changed registrations in Gr. 3-9	-0.18***	0.002	-0.18***	
Mobility - moving across districts/schools during senior-high years: categorical - moved=1; did not move=0	-0.44***	0.40***	-0.45***	0.40***
ESL: categorical, any ESL codes in Gr.3-9 =1; no ESL=0	-0.05	0.35**		0.31*
Special needs: categorical, dummy-coded (1 or 0); reference category - no special needs coding				
Any severe disability codes in Gr. 3-9 =1	-1.35***	-0.05	-1.36***	
Any mild/moderate disability codes in Gr.3-9 =1	-0.41***	-0.27**	-0.41***	-0.26**
Any mild/moderate disability codes in Gr.7-9 only =1	-0.59***	-0.29*	-0.59***	-0.28*
Any mild/moderate disability codes in Gr.3-6 only =1	-0.16*	-0.03	-0.16*	
Gifted: coded gifted in Gr. 3-9 = 1; not gifted= 0	0.30**	-0.32	0.30***	
Gender; male = 1; female = 0	-0.27***	-0.06	-0.27***	
Average years of teaching experience per teacher	0.002	-0.01		
Grade range – categorical, dummy-coded (1 or 0); reference– entered Gr.10 in schools teaching Gr.10-12 only				
Consistently registered in Gr.3-10 in a Gr.1-12 school	0.07	-0.15		
Consistently registered in Gr.7-10 in a Gr.7-12 only school	0.13 (p=0.09)	0.21	0.12 (p=0.09)	
Other school registration patterns	-0.17***	0.02	-0.16***	
School total student population (hundreds)	0.002	0.02 (p=0.05)		
Jurisdiction total student population (thousands)	-0.004***	-0.004*	-0.004***	-0.004***
Rural/urban locales: categorical, dummy-coded (1 or 0); reference category – students in schools in cities over 100,000				
Rural = 1	0.19	-0.07	0.16**	
Urban <25,000 = 1	0.21	-0.02	0.19**	
Urban 25,000 – 100,000 = 1	0.08	-0.07		
Schools in booming oil regions = 1; in other locales = 0	-0.16**	-0.02	-0.16**	
Schools proximal to colleges = 1; other = 0	-0.13*	-0.11		
Schools proximal to universities = 1; other = 0	-0.06	-0.20		
Average family income: continuous (thousands)	0.003*	0.001		
Average percent of families in owned dwelling: continuous	0.01*	0.003	0.01*	
Average total years of mother education: continuous	0.08*	0.06	0.13***	0.10**
Average percent of lone parent families: continuous	-0.01*	0.000	-0.02*	
Constant	0.88	-1.64	0.52	-2.05
Model Chi-Square	5,491.42***	168.18***	5482.78***	154.12***

*p<0.05; **p< 0.01; ***p<0.001

entering Grade 10 were analyzed. Second, the data on students who completed high school three years after entering Grade 10 or dropped out were removed from the original cohort. The data in the remaining sub-set of four-year continuers were analyzed separately. The results of these two logistic regression analyses involving "on-time" high school completers (three years after entering Grade 10) and continuers/late completers one year after are juxtaposed in Table 2 (the shaded columns depicting results on students continuing in their fourth year after entering Grade 10).

The binary logistic regression method was used to analyze the data, since the outcome high school completion variable is a categorical dichotomy. High school completers (credentialed and non-credentialed) three and four years after entering Grade 10 were coded as "1" and non-completers (leavers and continuers) were coded as "0." Logistic regression, instead of predicting the value of the outcome from predictor variables (as occurs in linear regression), predicts the *probability* of the outcome occurring (e.g., high school completion versus non-completion) given known predictor values. The coefficients for predictors shown in Table 2 are the values that need to be replaced in the regression equation to establish the probability that a case falls into a certain category (i.e., high school completer versus non-completer).[7] Significance estimates ($p<0.05$; $p<0.01$ and $p<0.001$) indicate whether the coefficients for predictors are significantly different from zero. If the coefficient is significantly different from zero, one can conclude that the predictor is making a significant contribution to predicting probability of the outcome (high school completion).[8]

Please note that the total number of analyzed students is lower than the original cohort (32,721), because only students in *regular* programs registered continuously in Alberta schools were selected for the regression analysis with the exclusion of on-line and home-educated senior-high students as well as students in outreach and other specialized programs. These unique groups of students were filtered out because the programming they received may differ substantially from the mainstream student population and because some examined predictor variables, such as school size or studying in a rural or urban school may be not applicable to them. Additionally, some predictor variables, such as SES data, missed information on a limited number of students.

Cohort Students Three Years after Entering Grade 10

The results shown in Table 2 indicate that academic achievement, mobility and special needs coding in various grades have a significant effect on high school completion three years after entering Grade 10. These variables emerged as highly significant predictors of high school completion. Students who did not write the achievement test or performed at below acceptable level were more likely to not complete high school than their counterparts who wrote the test and achieved at acceptable level (negative regression coefficients). Alternatively, not surprisingly, students who were achieving at the excellence level were more likely to complete high school than their peers who achieved at the acceptable level (positive regression coefficient). Both types of student mobility had a negative effect on high school completion three years after entering Grade 10, as did special needs coding at all grade levels. At the same time, students coded as gifted were more likely to complete high school than their counterparts who did not receive any special needs coding.

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[7] The regression coefficients in logistic regression are reported in log odds, which are natural logarithms of the odds of high school completion occurring.

[8] The majority of significance tests ($p<0.05$; $p<0.01$; and $p<0.001$) are two tailed, except for effects pertaining to the PAT, special needs-related, ESL, gender and SES variables, which are one-tailed. One-tailed (more lenient) test is appropriate when there is a hypothesis regarding the direction of the relationship, whereas a two-tailed test is more appropriate when there is no clear expectation about the relationship.

The final sequential regression model shown in Table 2 does not indicate significant effect of ESL on high school completion three years after entering Grade 10 when the effects of other predictors are controlled for. This outcome is understandable given the specifics of the studied student cohort. This cohort comprises students who were continuously studying in Alberta in Grades 3-10, does not incorporate "newcomers" who were joining the education system during these years and thus contains relatively small number of ESL students. Student gender, on the other hand, showed a significant association with high school completion, males being less likely than females to complete high school three years after entering Grade 10.

While no effects on high school completion were observed depending on school grade configuration and size, when the effects of other predictors were accounted for, particulars of school geography such as proximity to colleges and economically advancing (oil) regions as well as jurisdiction size showed negative links to high school completion. Introduction of four SES variables to the regression equation tells us that (controlling for the effects of other predictors) senior-high students from schools characterized by relatively high average family income and parent (mother's) education, high proportions of two-parent families and/or high percent of owned family dwellings were more likely to finish high school on-time (three years after entering Grade 10) than students from the lower SES schools. The emergence of student mobility and percent of families in owned dwellings as significant predictors of high school completion indicates that the overall (school-related and family) *stability* in students' lives could be an important factor contributing to high school completion.

Only a marginally significant effect of the SES variables on high school completion in the examined student cohort warrants further investigation. The plausible explanation of this outcome may be that these results are controlled for the effects of a substantial number of other predictor variables (some of which, such as mobility and achievement may be correlated with SES).

Cohort Students Four Years after Entering Grade 10

Table 2 shows the results of the same type of binary multiple logistic regression analysis using the sub-set of data that excluded all students who completed or dropped out of high school three years after entering Grade 10. Thus this analysis focuses on the "second wave" of late completers and non-completers (continuers and leavers) in the fourth year after entering Grade 10. Consequently, the number of students in this subset is much lower than the original cohort, but still substantial for reliable data analysis.

The data on students continuing into the fourth year after entering Grade 10 revealed a pattern of associations that was notably different from the students in their third year. First, the range of significant predictors of high school completion narrowed substantially to include only achievement, mobility, ESL, special needs and jurisdiction size. The direction of association between high school completion and academic achievement was similar to the results for the cohort of students three years after entering Grade 10. The link to special needs status boiled down to the negative effects of being coded with mild/moderate disabilities in Grades 7-9 and 3-9. Being coded with mild/moderate disabilities in early grades only (Grades 3-6), with severe disabilities or as a gifted student did not appear to have effect on high school completion outcomes at this later stage.

A remarkable finding was a drastic change in the relationship with mobility predictors. While the effect of long-term "mobility history" such as the cumulative number of school registrations prior to

Grade 10 showed no significant effect for the probability of high school completion among the four year continuers, the mobility measured as a district/school change incidence after starting Grade 10 emerged as a *positive* predictor. One of the possible explanations of this finding is likelihood of some students moving to schools with specialized programs that assisted them with high school completion. This finding renders additional support to the above-stated proposition that student mobility should be given a complex, multifaceted measurement and examination in order to grasp a broad spectrum of underlying causes and outcomes for different groups of students.

By analogy, the ESL-related predictor variable completely changed its dynamics for the four year continuers by emerging as a significant positive predictor of the probability of high school completion. This result may be reasonable since the cohort data does not include new ESL influxes. A substantial portion of the cohort ESL students continuing into the fourth year after entering Grade 10 might either have overcome the language-related constraints and/or display relatively high perseverance in attaining high school completion.

Another notable result of the multiple regression analysis is absence of SES effects on high school completion for the four year continuers. This finding warrants further investigation using different student cohorts and might be explained by either the shortcomings of school-related SES data or by weakening links with SES variables due to students becoming more mature and increasingly independent.

Finally, controlling for the effects of other predictor variables, no gender-based differences in high school completion were observed for the four year continuers. Combined with other findings associated with this group of students, it could be suggested that they may be different in many respects from the on-time completers.

In summary, it appears that factors associated with high school completion examined in this study tend to lose their cumulative "predictive power" for the students who continue beyond Grade 12. There is a possibility that the continuers who did not complete high school in Grade 12 encounter different issues and circumstances that need to be identified and accounted for when the decisions are made regarding assisting these older students with finishing high school. There could be particular "environmental" issues, such as various family, personal or work circumstances, or late continuers and completers might display notable personality and/or learning style differences compared to their counterparts who finish high school on-time. In all, the emerged results confirm Hull's (2009) thesis that late continuers and high school completers is a largely overlooked group of students that require close examination in order to improve their high school completion outcomes.

The Results of Applying Alternative, Stepwise Regression Method

The alternative, stepwise regression was also run on the data for comparative purposes. When explorative stepwise regression method is applied, all predictors are entered in the model simultaneously and the set of key, statistically significant predictors is identified by the statistical program. The results of this analysis, which are shown in Table 2 under the Stepwise Method heading (predictors with $p<0.10$ were removed from the model by the statistical program), are not much different from the outcomes produced by the above-described sequential regression method, with only a few exceptions. For example, according to the stepwise results and congruent with bivariate findings discussed in previous sections, when the effects of other predictors were controlled for, cohort students in rural and small (under 25,000) urban locales were more likely to complete high school three years after entering Grade 10 than students in large cities with residents

exceeding 100,000. Additionally, unlike the results of sequential analysis, average family income did not emerge as a significant predictor of the probability of high school completion three years after entering Grade 10.

Discussion and Policy Implications: The findings resulting from multiple logistic regression analysis have clear implications for further research and policy and program development. Specifically:

- An essential role of student mobility among other examined high school completion predictors calls for a concerted effort on the part of the jurisdictions, schools, social agencies and other organizations and communities to: (1) create safe and supportive school environments (especially for low SES students), which could provide stable relationships for students lacking stability at home; and (2) combat/prevent family mobility. Addressing a comprehensive array of multiple factors associated with student mobility would align well with the concept of providing "wrap-around," one-stop services at schools for students and their families, including early and family literacy, tutoring, health-related counseling and so on. Also, a "simple" initiative such as providing transportation to students who changed their residency within the same neighborhood or moved to an adjacent area so that they could continue attending the same school may make a major difference in terms of their engagement, academic achievement and eventual high school completion.

- The results of regression analysis also confirmed that special needs (both severe and mild-moderate disabilities) have a significant effect on high school completion, especially three years after entering Grade 10). These findings support early diagnosis and interventions.

- As already mentioned in this report, seemingly "counterintuitive" finding that students in communities that also had a post-secondary institution tended to complete high schools at a relatively lower rate begs for further investigation of the post-secondary sector's engagements with the surrounding school systems as well as its recruitment strategies.

- A steady positive association between a smaller jurisdiction size and high school completion merits further research into the specific attributes of smaller school districts' education environments that may contribute to higher high school completion rates.

- The finding that a broad assortment of examined predictors that explain the probability of high school completion three years after starting Grade 10, "do not work" when the second, fourth-year wave of continuers was analyzed is an important starting point for developing an evidence-based differentiated approach to older students trying to complete high school after Grade 12. New evidence beyond conventionally considered variables should be identified and collected to uncover the key factors that may affect high school completion at these later stages. For example, it is reasonable to suggest that the nature of supports becomes very important for the students who continue beyond Grade 12 and more research and resources should be allocated to investigate programming supports. Therefore, the nature of the school programs could be a very powerful predictor of high school completion at this stage and it is very important to measure the associated effects. Identifying potential personality-related, learning and other particular traits of continuers and late completers that may distinguish them from on-time high school completers would assist in the decision making regarding customized programs and supports.

- Finally, the results of multiple logistic regression analysis illustrate a remarkable complexity of the high school completion issue. This study managed to assemble a notably broad set of predictors as a result of combining corporate education, Statistic Canada, as well as literature-based data sources. Inclusion of multiple predictors resulted in an integrated model that made it possible to grasp a simultaneous interaction of diversified factors associated with high school completion. However, it is obvious that this set of predictors, many of which have been conventionally used to examine and predict student achievement, is still limited for explaining why some students complete high school and others drop out. Since raising and/or maintaining high levels of high school completion will remain a vital issue in the foreseeable future, it is imperative to customize data collections to generate evidence to assist decision-making pertinent specifically to the high school completion issue.

For example, "the most immediate and persistent issue for students and teachers is not low achievement, but student disengagement" (Newmann, 1992, p.2). Many students and almost all early school leavers feel disconnected from their schools and perceive them as unfamiliar and uninviting places (Community Health Systems Resource Group, 2005). Therefore, the data measuring students' orientation to school and fit in their school environments is vital for the understanding the high school completion issues and developing effective strategies and interventions targeting gains in high school completion rates. The Student Orientation to School Questionnaire (SOS Q) developed at System Improvement Group (SIG) is a comprehensive, valuable tool for measuring student affect towards school at a jurisdiction or school level. The SOS data and other similar instruments may be used by jurisdictions in combination with additional data relevant to high school completion to attain more complete understanding of why some students leave school early.

The major purpose of this report is to provide a systematic, coherent examination of multiple variables associated with high school completion for a consistent longitudinal cohort of the Alberta student population, covering the "educational history" of 32,721 1995-96 Grade 3 students to Grade 12 and beyond. Therefore, unlike disintegrated analyses of selected individual variables at different time periods using different student samples, the report offers an integrated picture of the dynamics of a broad variety of factors that may affect high school completion.

The report empirically verifies for Alberta-specific contexts hypotheses about the factors that might be related to high school completion in relationship to findings that have been empirically confirmed for different education systems and environments. As well, the study tests new propositions, some of which are based on the local grassroots information from the schools and jurisdictions. This report, as well as the analyses and reports that will follow, can be used as a reference source containing Alberta-based empirical evidence for practical decision-making.

As far as the report's findings are concerned, the following major points can be identified:

1) First and foremost the study clearly illustrates that high school completion is a *prolonged process* rather than a single occurrence or event. For example, the report empirically substantiates a notion of the key importance of early school years for eventual student success at the secondary level. Provincial Achievement Test (PAT) data revealed that early failures at the Grade 3 level (such as earning a "below acceptable" mark on the tests) have a notable negative association with eventual high school completion. At the same time, it is plausible to suggest based on the available data, that some "deterrents," such as being an English as a second language (ESL) student or a student with mild or moderate special needs, can be overcome during the earlier phases of schooling (e.g., prior to entering junior-high school), and high school completion outcomes either would even-out or come close to the rates of the "mainstream" student populace. Based on the initial stage of data analysis involving a set of bivariate, variable-by-variable analyses, high school completion was found to have a sizeable association (approximately ten to thirty percent difference in high school completion rates) with the following individual variables:

   - Student mobility, defined as a total number of changed school registrations, had a clear negative association with high school completion.
   - Academic achievement (provincial achievement tests [PAT] results) at various stages of schooling (i.e., in Grades 3, 6 and 9): better achievement results and lack of test absenteeism were clearly, consistently and positively associated with eventual high school completion rates.
   - The frequency (number of times) of ESL coding during junior-high school (grades 7 -9) was negatively linked to eventual high school completion.
   - Understandably, the degree of "severity" of special needs coding was directly and negatively associated with high school completion results (e.g., students with one or more severe disability codes completed school at much lower rates than students in one or more mild or moderate special needs categories). At the same time, gifted students notably outperformed their counterparts with no special needs codes.

- The frequency (number of times) of mild/ moderate (and/or other disabilities) special needs coding applied especially at the junior-high level (Grades 7 - 9) was negatively associated with high school completion. Early diagnosis and intervention had a less negative association.
- Type of school program: senior high students reported in exclusively virtual, home and outreach (and other specialized) programs were found to be far behind in high school completion from the students in "regular" school programs, although outreach programs clearly assisted some students to complete.
- Teaching experience: senior high students in schools having 10 or less years of average teaching experience per teacher tended to have lower high school completion rates than their counterparts who were taught by more experienced teachers.
- Socio-economic status (SES) based on 2001 census data, such as average family income, average years of mother's education and percent of families in owned dwellings showed positive linkages to high school completion, while percent of lone income families had a negative association with high school completion rates.

In addition, high school completion outcomes were positively, but less notably, associated with the following variables (less than ten percent of observed difference in high school completion rates):
- female gender;
- schools' grade configurations that incorporate elementary and/or junior-high components in addition to high school grades;
- schools located in small urban or rural locales;
- schools' proximity to less economically "booming" (oil development) areas;
- schools' distance from colleges or universities; and
- smaller jurisdiction size.

2) At the same time, the study demonstrated that high school completion is a *remarkably complex phenomenon* and the effects of many associated factors may require joint examination and additional data collections, in order to grasp their effects on high school completion.

In particular, the study inferred that a homogeneous approach to student mobility examination (e.g., only counting of the number of student moves) may not fully grasp the complex nature and effects of this multifaceted phenomenon. For example, different aspects of student mobility and different motives for changing schools at various stages of schooling should be given consideration.

Higher high school completion rates in rural and relatively small urban locales compared to large cities may be explained by the possible influences of low SES city cores. It was also suggested that the potential effects of school size (which on its own did not show much association with high school completion) are considered in conjunction with other variables that could be linked to high school completion (such as various grade configurations, rural or urban schools' specificities, etc). Put another way, school size may matter largely in relationship to the context. The flexible concept of "optimal" school size was proposed that would support a diversity of programs and services, while allowing personable school environments and attention to individual students' needs.

The broadly perceived negative association between a growing economy (e.g., in Northern Alberta oil resource regions) and high school completion was somewhat evident in the cohort

student data, but apparent differences in high school completion were not large. Somewhat unexpectedly, the data revealed that schools' proximity to economically booming regions could be associated with lower high school completion among young females rather than males. In contrast, males were more likely to leave school early irrespectively of geographic location. The report emphasizes the explorative character of these preliminary findings and suggests further investigation of the issue using different data configurations.

The data on direct proximity of post-secondary institutions revealed somewhat "counterintuitive" results: cohort students studying in schools located in the same communities with a university and/or college campuses/sights tended to show somewhat lower high school completion rates than their counterparts studying in locations with no post-secondary institutions. This seemingly counterintuitive finding generated further hypothesis on the likely "isolation" of certain segments of students from the information on post-secondary opportunities. For example, substantial proportions of city core, low SES student populations might not perceive and utilize educational benefits sprouting from a close proximity to large university centers. Additionally, there is a possibility of limited engagement of some local post-secondary institutions from the surrounding school systems.

3) Simultaneous examination of the above-mentioned high school completion predictors using multiple logistic regression analysis illustrated that high school completion may be a very *dynamic* process, which may entail differentiated priorities and supports, depending on the stage of high school completion process and types of potential completers and their specific traits and needs.

To start with, after the effects of all examined predictor variables were accounted for, the following key predictors were identified for high school completion outcomes three years after entering Grade 10:

Factors increasing likelihood of high school completion
- academic achievement
- gifted coding
- gender – female
- students attending rural high schools or schools in small urban communities under 25,000
- average family income
- average total years of mother's education
- average percent of families in owned dwelling

Factors decreasing likelihood of high school completion
- student mobility – cumulative number of changed school registrations prior to entering Grade 10
- student mobility – district/school change incident(s) after starting Grade 10
- special needs coding
- larger jurisdiction size
- schools proximity to economically expanding (oil) regions
- schools proximity to colleges
- average percent of lone parent families.

The subsequent finding that the majority of these identified significant predictors did not contribute to predicting the probability of high school completion for the students who continued into the fourth year after entering Grade 10, constitutes the important new evidence that begs for conducting customized follow-up studies and data collections specifically for addressing high school completion issues. In addition, this new evidence suggests that the nature of programming and supports (including creating engaging school environments) may be imperative for helping these older, continuing students complete high school. Close examination of personality, learning-related and other distinctive features of continuers and late high school completers may assist in the decision making regarding customized programs and supports.

RECOMENDATIONS

1. Conduct additional data collections and analyses of the high school completion issue at both provincial and local (jurisdiction/school) levels in order to effectively adjust programs to the multiple, dynamic factors affecting high school completion. Specifically:

   - Extend the collection of school level data and its application for decision-making regarding raising high school completion, including student orientation to/engagement with school, effects of various types of programming, etc. (Most of the student progress occurs at a school level).

   - Use Grade Level of Achievement (GLA) data additionally to PATs in future analysis of program quality effects on high school completion.

2. Provide differentiated programming for students who continue after Grade 12 (4th/5th year after entering Grade 10). The specific nature of supports imperative for the late high school completers' success needs to be further researched to identify key program components.

3. Research and verify preliminary findings that indicate lower high school completion rates among outreach and virtual/home-ed students. Consider the experience of some Alberta districts of encouraging student transition from specialized programs back into traditional high schools with appropriate supports.

4. Extend evidence-based examination of high school completion, including necessary data collection, to junior-high students, some of whom drop out before Grade 10. The reasons for early school leaving and the needed supports should be identified and compared to the factors contributing to high school non-completion at the senior-high level.

5. Student disengagement from school should be taken into consideration in the decision-making with regard to increasing high school completion. The Student Orientation to School Questionnaire (SOS Q), undergoing final stages of development, and similar instruments could be used to identify students at risk and to research and develop targeted strategies and interventions.

6. Explore ways of addressing the reasons for and negative effects of student mobility to add to stability in students' lives. For example.:
   - Creating more supportive school environments for highly mobile students (e.g. tutoring) would be conducive of stable relationships for students lacking continuity in their school programs.

- Providing "wrap-around," one-stop services at schools for students and their families including early/family literacy, tutoring and various student and family counseling, may strengthen family links with both schools and communities.
- Providing transportation support to students who moved residency, so that they continue attending the same schools is a simple but potentially effective measure to offset the negative effects of student mobility such as disengagement from school and low achievement.

7. Adopt a differentiated approach to the multifaceted phenomenon of student mobility which is driven by diverse circumstances to better understand causation and solutions (e.g., data collection, research, policies and supports).

8. Explore the possibility of more comprehensively tracking students using variables that affect high school completion in order to identify high risk students, alert jurisdictions and support these students in completing school.

9. Engage the post-secondary sector in addressing high school completion issues. The finding that students in communities with a local college tended to complete high school at a relatively lower rate calls for further research into the linkages between basic and post-secondary education. For example, dual-credit policies and enhanced information regarding post-secondary options could help students with post-secondary graduation and career goals.

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